THE GERONTOLOGICAL SOCIETY OF AMERICA®

Journals of Gerontology: Psychological Sciences
cite as: *J Gerontol B Psychol Sci Soc Sci*, 2020, Vol. XX, No. XX, 1–7
doi:10.1093/geronb/gbaa068
Advance Access publication May 19, 2020

OXFORD

Original Research Report

COVID-19 Worries and Behavior Changes in Older and Younger Men and Women

Sarah J. Barber, PhD* and Hyunji Kim, MA

Department of Psychology, Georgia State University, Atlanta.

*Address correspondence to: Sarah Barber, Department of Psychology, Georgia State University, PO Box 5010, Atlanta, GA 30302. E-mail: sbarber10@gsu.edu

Received: April 14, 2020; Editorial Decision Date: May 12, 2020

Decision Editor: Derek Isaacowitz, PhD

Abstract

Objectives: The case fatality rate of coronavirus disease 2019 (COVID-19) is higher among older adults than younger adults and is also higher among men than women. However, worry, which is a key motivator of behavioral health changes, occurs less frequently for older than younger adults, and less frequently for men than women. Building on this, we tested whether older adults–and particularly older men—would report the least amount of COVID-19 worry and also fewer COVID-19 behavior changes.

Method: From March 23–31, 2020, we administered an online questionnaire assessing COVID-19 perceptions, worries, and behavior changes. Participants were a convenience sample of U.S. residents, who were community-dwelling younger adults (18–35) or older adults (65–81). Analyses included 146 younger adults (68 men, 78 women) and 156 older adults (82 men, 74 women). Participants were predominately white, living in suburban/urban areas, and had completed some college.

Results: During the early phase of the outbreak in the United States, older adults perceived the risks of COVID-19 to be higher than did younger adults. Despite this, older men were comparatively less worried about COVID-19 than their younger counterparts. Compared with the other participants, older men had also implemented the fewest behavior changes.

Discussion: Interventions are needed to increase COVID-19 behavior changes in older men. These results also highlight the importance of understanding emotional responses to COVID-19, as these are predictive of their behavioral responses.

Keywords: Aging, COVID-19, Emotion, Sex differences

Motivated by the rapid spread of the coronavirus disease 2019 (COVID-19) pandemic, this research examines whether younger and older men and women differ in their COVID-19 related worries and behavior changes. Although COVID-19 has an overall mortality rate of around 2%–3%, the case fatality rate is higher among older adults and also higher among men than women (Wu & McGoogan, 2020). For instance, of the COVID-19 deaths in Italy, 83% have been individuals aged 60 or older, and 80% have been men (Remuzzi & Remuzzi, 2020). Because of this, it would be logical to assume that older adults, and particularly older men, would be more worried about, and taking more precautions against, COVID-19.

However, prior research suggests that worry occurs less frequently for older, when compared with younger adults (e.g., Basevitz, Pushkar, Chaikelson, Conway, & Dalton, 2008; Gould & Edelstein, 2010; Gould, Gerolimatos, & Edelstein, 2015; Hunt, Wisocki, & Yanko, 2003), and worry occurs less frequently for older men than for older women (Golden et al., 2011). Older adults, and particularly older men, also worry less about death and their own mortality (Russac, Gatliff, Reece, & Spottswood, 2007).

Typically, these age-related declines in worry are beneficial. Worry has been associated with increased risk for cardiovascular disease (Kubzansky et al., 1997), with poorer physical health (Behar, McHugh, & Otto, 2010), and with

greater declines in learning and memory over time (Pietzak et al., 2012). However, within the context of preventative health behaviors, worry can also be beneficial, as it is a key determinant of behavior. For example, research has shown that anticipatory worry is predictive of positive health behaviors such as getting flu shots (Chapman & Coups, 2006), smoking cessation (Dijkstra & Brosschot, 2003), HIV testing (Crosby, Bonney, & Odenat, 2004), and engaging in cancer-screenings (Hay, McCaul, & Magnan, 2006; McCaul & Mullens, 2003). Worry also predicted favorable health behavior changes during the SARS epidemic (Lau, Yang, Tsui, & Kim, 2005).

Building on these findings, we tested whether older adults, and particularly older men, may also be less worried about COVID-19 than their younger counterparts. We also tested whether this, in turn, had implications for their implementation of behavior changes.

Method

Participants

Participants were a convenience sample of community-dwelling U.S. residents, who were younger (18–35 years) or older in age (65–81 years) recruited using the Cloud Research panel services (www.cloudresearch.com). We excluded participants whose age was not within our inclusion criteria, who stated that their data should be discarded because they were distracted (see Procedure section), or who reported a confirmed COVID-19 diagnosis. This resulted in a sample of 146 younger adults (68 men, 78 women) and 156 older adults (82 men, 74 women). Power analyses conducted in G*Power 3.1 specifying a β/α ratio of 4 with four groups, showed that this sample size provided more than 80% implied power to detect effects of at least $f = .162$ within ANOVA analyses. For participant factors as a function of age and gender, see Table 1.

Materials

We created a questionnaire assessing responses to COVID-19, including risk perceptions, worries, and behavior changes. Questions were based in part upon studies testing the psychological impact of SARS (Cheng, Wong, & Tsang, 2006; Puterman, Delongis, Lee-Baggley, & Greenglass, 2009; Wong, Gao, & Tam, 2007).

COVID-19 risk perception

To assess risk perception, participants indicated on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale whether they thought people are over-reacting about COVID-19 and whether COVID-19 is really no different than the flu. Responses to these questions were highly correlated ($r = .696$, $p < .001$). Responses were reverse-scored so that higher numbers indicate greater perceived risk, and then averaged to create a composite risk perception score.

COVID-19 worries

Participants indicated the extent to which they worried about the impact of COVID-19 for each of the following: (i) personally catching it, (ii) dying as a result of it, (iii) a family member catching it, (iv) disruptions to own lifestyle, (v) local hospitals being overwhelmed, (vi) economy entering a recession, (vii) local stores running out of important things (such as food or medicine), and (viii) family's income declining because of it. Each question was answered using the following response options: (a) not at all, (b) a little, (c) a moderate amount, (d) a lot, and (e) a great deal. Responses to these eight questions were averaged to create a composite worry score (Cronbach's alpha = .88).

COVID-19 behavior changes

Participants indicated whether or not they had engaged in certain behaviors. Some behaviors had clear benefits in reducing infection risk and included: (i) washed hands more frequently, (ii) taken more care about cleanliness, (iii) worn a surgical/ hygiene mask, (iv) stopped shaking hands, (v) stopped touching own face, (vi) stopped socializing with others, (vii) begun avoiding public places (such as restaurants, public transportation, libraries, or stores), and (viii) gone into complete quarantine. We also assessed other behaviors that had less clear health benefits: (ix) eaten a more balanced diet in an effort to avoid contracting COVID-19, (x) taken additional vitamins or supplements in an effort to avoid contracting COVID-19, (xi) purchased extra food, and (xii) purchased extra medical supplies, including medications. Although we did not assess the reasons for purchasing extra food or medical supplies, we reasoned these behaviors should allow people to shelter-in-place longer. All questions had three response options: (a) Yes, (b) I am considering it, but not yet doing it, and (c) No. For analyses, we treated these as dichotomous variables and combined the latter two response categories. Responses were summed to create a behavior change score (Cronbach's alpha = .81).

Procedure

Procedures were approved by the Institutional Review Board at Georgia State University. After providing consent, participants completed an online study, which contained the questions assessing COVID-19 risk perceptions, worries, and behavior changes (see Materials section), as well as other tasks not described here. At the end, participants indicated whether their data should be excluded from analyses and were assured their response would not affect compensation. Compensation varied based upon recruitment sources and included charity donations, gift card reward points, or payments up to $2. The compensation method was managed by Cloud Research panel services and is unknown to the researchers.

Data Collection Timeline

COVID-19 was declared a pandemic by the World Health Organization on the 11th of March 2020. Our data were collected on the 23rd, 25th, 27th, 29th, and 31st of March 2020. During this time period, responses to COVID-19 in the United States were rapidly evolving. Over these 9 days, the number of COVID-19 cases in the United States increased from 44,183 to 186,101, and the number of States implementing stay-at-home order increased from 9 to 32 (KFF, 2020). On March 26, the United States also surpassed China to become the country with the most reported COVID-19 cases.

Results

COVID-19 Risk Perceptions

Overall, 24.5% of participants expressed at least some agreement that people are overreacting, and 18.3% expressed at least some agreement that COVID-19 is no different than the flu. However, within a 2 (age group) × 2 (gender) ANOVA, we found that COVID-19 composite risk perception scores varied based upon age, $F(1, 298) = 30.89$, $p < .001$, $\eta_p^2 = .09$, and gender, $F(1, 298) = 5.34$, $p = .022$, $\eta_p^2 = .02$. Overall younger adults perceived the risks of COVID-19 to be lower than did older adults, and men perceived the risks to be lower than did women (Table 2). The interaction between age and gender was not significant, $F(1, 298) = 0.55$, $p = .460$, $\eta_p^2 < .01$.

COVID-19 Worries

On average, participants endorsed a moderate level of COVID-19 worry ($M = 3.31$), and only one participant (an older male) reported having absolutely no worry about COVID-19. However, in a 2 (age group) × 2 (gender) ANOVA on our composite worry score, there was a significant main effect of age, $F(1, 298) = 5.78$, $p = .017$, $\eta_p^2 = .02$, which was qualified by a significant interaction between age and gender, $F(1, 298) = 11.27$, $p = .001$, $\eta_p^2 = .04$. Although participants reported moderate-to-high levels of worry, older men were relatively less worried than other participants (Table 2).

COVID-19 Behavior Changes

On the most important behavior change outcomes there was high endorsement. More than 80% of participants reported washing their hands more frequently, taking more care about cleanliness, no longer shaking hands, and avoiding public places. More than 60% of participants also reported no longer socializing with others. However, when looking at the total number of behavior changes endorsed,

Table 1. Participant Factors as a Function of Age and Gender

	Younger adults		Older adults	
Participant factor	Male	Female	Male	Female
Sample size (*n*)	68	78	82	74
Age (years)	29.8 (5.3)	27.9 (4.9)	70.2 (3.2)	70.4 (3.7)
Subjective health	5.5 (1.3)	5.4 (1.2)	4.8 (1.4)	4.9 (1.2)
Education (years)	15.3 (3.3)	15.4 (2.6)	15.5 (2.5)	14.3 (2.2)
Political orientation	4.1 (2.0)	3.7 (1.7)	4.1 (2.0)	3.9 (2.2)
% Married	42.6	38.5	70.7	47.3
% Rural	16.2	23.1	22	23
Subjective SES	6.1 (2.2)	5.3 (1.8)	6.1 (1.7)	5.8 (2.0)
% Caucasian/white	72.1	67.9	91.5	89.2
% Employed (part-time or full-time)	76.5	61.5	11.0	14.9
Number people know with COVID-19	1.6 (6.2)	1.0 (5.7)	0.06 (0.3)	0.04 (0.2)
Daily time spent thinking, reading, talking about COVID-19 (% endorsed)				
None at all	10.3	5.1	6.1	1.4
Less than 1 hr	22.1	37.2	37.8	21.6
1–3 hr	26.5	33.3	35.4	47.3
4–6 hr	26.5	15.4	8.5	13.5
7–9 hr	13.2	3.8	6.1	6.8
≥10 hr	1.5	5.1	6.1	9.5

Notes. COVID-19 = coronavirus disease 2019. Numbers in parentheses represent standard deviations. Subjective health was reported on a 1 (*very poor*) to 7 (*excellent*) scale. Political orientation was reported on a 1 (*Strong Democrat*) to 7 (*Strong Republican*) scale. Marital status was coded as 1 if the participant reported being married or living with someone in a marital type relationship, otherwise it was coded as 0. Rural/urban dwelling was coded as 0 for rural, and 1 for suburban or urban. Subjective socioeconomic status was assessed via the McArthur Scale of Subjective Status, and scores can range from 1 (*lowest status*) to 10 (*highest status*). Participants self-reported their race and ethnicity, and this was later coded as 1 for non-Hispanic whites, and 0 for all other racial/ethnic identities or was not reported. Participants self-reported their employment status, and this was later coded as 1 for employed (either part-time or full-time) and 0 for all other employment statuses (i.e., student, retired, unemployed and looking for work, unemployed and not looking for work, homemaker, and unable to work).

Table 2. Mean COVID-19 Perceptions, and COVID-19 Worries as a Function of Age Group and Gender

COVID-19 perceptions and worries	Younger adults		Older adults	
	Male	Female	Male	Female
COVID-19 perceptions				
People are overreacting	4.1 (2.0)[a,b]	4.5 (1.9)[c]	5.1 (1.7)[a]	5.7 (1.6)[b,c]
COVID-19 no different than flu	4.6 (1.9)[a,b]	4.9 (1.8)[c]	5.5 (1.5)[a]	5.9 (1.4)[b,c]
Composite risk perception score	4.4 (1.8)[a,b,c]	4.7 (1.7)[a,d]	5.3 (1.5)[b]	5.8 (1.3)[c,d]
COVID-19 worry				
Personally catching it	3.5 (1.3)[a]	3.0 (1.3)	2.8 (1.0)[a]	3.3 (1.2)
Dying from it	3.0 (1.5)[a,b]	2.4 (1.4)[a]	2.3 (1.0)[b]	2.8 (1.3)
Family member catching it	3.6 (1.2)[a]	3.5 (1.3)[b]	3.0 (1.1)[a,b,c]	3.6 (1.2)[c]
Disruptions to lifestyle	3.7 (1.2)[a]	3.6 (1.2)[b]	3.0 (1.3)[a,b]	3.5 (1.2)
Family income declining	3.4 (1.3)[a]	3.2 (1.3)[b]	2.2 (1.3)[a,b,c]	2.9 (1.5)[c]
Store shortages (food, medicine)	3.7 (1.0)[a]	3.5 (1.2)	3.1 (1.2)[a]	3.4 (1.3)
Local hospitals overwhelmed	3.7 (1.0)	3.8 (1.2)	3.4 (1.2)[a]	4.0 (1.0)[a]
Economic recession	3.8 (1.1)	3.8 (1.2)	3.9 (1.2)	4.1 (1.1)
Composite worry score	3.6 (0.9)[a]	3.3 (0.9)[b]	3.0 (0.9)[a,b,c]	3.4 (0.9)[c]

Notes. COVID-19 = coronavirus disease 2019. Numbers in parentheses represent standard deviations. COVID-19 risk perception questions were answered on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. However, to ease interpretation, these items were reverse-scored so that higher numbers indicate higher perceived risk. The numbers presented here represent the means and standard deviations after reverse scoring. COVID-19 worry questions were answered using the following scale: 1 = not at all, 2 = a little, 3 = a moderate amount, 4 = a lot, and 5 = a great deal. For each outcome measure, we used Tukey HSD post hoc tests to compare the four groups (younger men, younger women, older men, and older women). Within each row, when two means share a letter, it indicates that they were statistically different ($p \leq .05$) from one another.

Table 3. Behavior Changes in Response to COVID-19 as a Function of Age Group and Gender

Behavior changes	Younger adults		Older adults	
	Male	Female	Male	Female
Wash hands more	85.3	87.2	86.6	95.9
More careful about cleanliness	86.8	85.9	81.7	90.4
Worn a mask	50.0[a,b,c]	23.1[a,d]	7.3[b,d]	10.8[c]
Stop shaking hands	80.9	83.3	84.1	94.6
Stop touching own face	55.9[a]	52.6[b]	31.7[a,b,c]	66.2[c]
Stop socializing	60.3[a]	69.2[b]	74.4	89.2[a,b]
Avoid public places	80.6[a]	84.6	81.7[b]	95.9[a,b]
Gone into complete quarantine	56.3	47.9	36.5	38.7
Purchased extra food	70.6[a]	66.7[b]	42.7[a,b,c]	63.5[c]
Purchased extra medical supplies or medications	66.2[a,b,c]	35.9[a]	23.2[b]	32.4[c]
Balanced diet to avoid	52.9[a]	39.7	30.5[a]	45.2
Vitamins to avoid	61.8[a,b]	43.6	28.4[a]	35.1[b]
Mean (and *SD*) total behavior change score	8.0 (3.5)[a]	7.2 (2.9)	6.0 (2.7)[a,b]	7.5 (2.3)[b]

Notes. COVID-19 = coronavirus disease 2019. For each specific behavior assessed, the numbers represent the percentage of participants who indicated that they had made the behavioral change. Questions were answered using the following scale: 1 = yes, 2 = I am considering this, but not yet doing it, and 3 = no. For analyses, these were dichotomized by combining the latter two categories. For each individual outcome measure, we used a series of pairwise chi-square tests to compare the four groups (younger men, younger women, older men, and older women) in terms of their yes versus no responses. For the total behavior change score, we calculated how many specific behavior changes each participants endorsed. In analyses, we used Tukey HSD post hoc tests to compare the average total number of changes endorsed by the four groups (younger men, younger women, older men, and older women). Within each row, when two percentages or means share a letter, it indicates that they were statistically different from one another. For the chi-square tests, we used a significance level of $p \leq .01$.

within a 2 (age group) × 2 (gender) ANOVA, there was a main effect of age, $F(1, 298) = 6.21$, $p = .013$, $\eta_p^2 = .02$, which was qualified by an interaction between age and gender, $F(1, 298) = 12.26$, $p = .001$, $\eta_p^2 = .04$. Compared with other participants, older men endorsed the fewest number of behavior changes. Follow-up item-level Tukey post hoc comparisons (given in Table 3) showed that this was because older men were relatively less likely to have worn a mask, to report having stopped touching their faces, or to have purchased extra food. In contrast, older women did not significantly differ from younger adults in terms of total number of behavior changes, and item-level

Table 4. Bivariate Correlations Between Composite Behavior Change Scores With COVID-19 Risk Perceptions, and COVID-19 Worries as a Function of Age Group and Gender

	Risk perceptions	Worry	Difference
Younger men	.030	.597**	$z = -3.87$, $p < .001$
Younger women	.297**	.543**	$z = -2.10$, $p = .018$
Older men	.353**	.422**	$z = -0.68$, $p = .248$
Older women	.103	.295*	$z = -1.35$, $p = .088$

Notes. COVID-19 = coronavirus disease 2019. For each group, we assessed whether the correlation between total COVID-19 behavior changes and COVID-19 risk perceptions was significantly different in magnitude from the correlation between total COVID-19 behavior changes and COVID-19 worry. This was done using the dependent samples calculator at https://www.psychometrica.de/correlation.html.
*$p < .05$, **$p < .01$.

post hoc comparisons (Table 3) suggest that older women were the most likely to report social distancing and avoiding public places.

Relationships Between COVID-19 Worry, Risk Perceptions, and Behavior Changes

COVID-19 worry was related to the total number of behavior changes made in response to COVID-19. As given in Table 4, this was true for all participants, regardless of age or gender. Although worry tended to be more strongly associated with behavior change than risk perceptions, this difference was only statistically significant for the younger adult participants.

Covariates

None of the conclusions reported above change when including the following covariates in analyses: (i) data collection date, (ii) subjective health, (iii) educational attainment in years, (iv) political orientation, (v) marital status, (vi) rural/urban dwelling, (vii) subjective socioeconomic status, (viii) employment status, and (ix) race/ethnicity.

Discussion

Perceived risk and worry are often discussed synonymously, as both involve beliefs about negative future consequences. However, within the context of COVID-19, we found that perceived risk and worry had different associations with age and gender. Older adults perceived the risks of COVID-19 to be higher than did younger adults. However, older men were less worried about COVID-19, particularly when compared with their younger counterparts.

These findings are consistent with prior research showing that older adults report less worry than younger adults, and men report less worry than women (e.g., Crittendon & Hopko, 2006). They are also broadly consistent with research showing that compared with younger adults, older adults exhibit less health anxiety (Gerolimatos & Edelstein, 2012), and also exhibit less worry and fewer PTSD symptoms following natural disasters and terrorist attacks (e.g., Scott, Poulin, & Silver, 2013; Shrira, Palgi, Hamama-Raz, Goodwin, & Ben-Ezra, 2014). This may be due to older adults possessing superior emotion regulation and coping strategies (e.g., Charles, 2010). Consistent with this, Yeung and Fung (2007) examined the emotional responses of Hong Kong residents (aged 18–86) to the SARS epidemic. Although they did not assess worry, they found that older adults consistently reported less anger and also had the greatest increase in the use of emotion-focused coping strategies.

Age-related decreases in worry are likely beneficial for mental health. However, because worry is a key determinant of behavior (e.g., Hay et al., 2006), this may also result in older adults implementing fewer behavior changes. Consistent with this, the older men in this study not only had lower levels of COVID-19 worry, but also had implemented fewer behavior changes when compared with the other participants. This complements a prior report documenting a relationship between "functional fear" and COVID-19 behavior change (Harper, Satchell, Fido, & Latzman, 2020), and suggests that group differences in affective responses to the pandemic may play an important role in predicting behavior changes.

There are also limitations of this study to acknowledge. Our effect sizes were small, and our convenience sample were community-dwelling, predominately well-educated, white individuals with internet access. Although our results did not change when we adjusted for background factors, patterns reported here may not hold for all older adults. We also note that data collection took place from March 23 to 31, 2020, a time in which U.S. residents were still learning about the risks of COVID-19 and were formulating their emotional stance to the pandemic. Although this allowed us to examine group differences in first responses to the pandemic, patterns may change as the impact of COVID-19 changes over time.

In summary, in the early phases of the COVID-19 pandemic, participants in this study reported moderate levels of COVID-19 worry and had implemented substantial behavior changes to reduce COVID-19's spread. However, compared with the other participants, older men reported relatively less worry and the fewest total number of behavior changes. This is problematic given that the COVID-19 case fatality rate is also highest among older men (e.g., Remuzzi & Remuzzi, 2020) and suggests a critical need for COVID-19 behavioral change interventions targeted at older men (for a discussion of motivating self-regulated behavioral change in older adults, see Carstensen & Hartel, 2006). These results also highlight the importance of understanding emotional responses to COVID-19, and how

these may vary across different demographic groups, as worry is related to behavioral responses.

Funding

None reported.

Acknowledgments

This study was not preregistered. Data and study materials are available from the first author upon request.

Conflict of Interest

None reported.

References

Basevitz, P., Pushkar, D., Chaikelson, J., Conway, M., & Dalton, C. (2008). Age-related differences in worry and related processes. *International Journal of Aging & Human Development*, **66**(4), 283–305. doi:10.2190/AG.66.4.b

Behar, E., McHugh, R. K., & Otto, M. W. (2010). Elucidating the relationship between worry and physical health. *Journal of Experimental Psychopathology*, **1**(1), 119–132. doi:10.5127/jep.008210

Carstensen, L. L., & Hartel, C. R. (2006). Motivation and behavioural change. In L. Carstensen & C. Hartel (Eds.), *Committee on aging frontiers in social psychology, personality, and adult developmental psychology (pp.* 34–53*)*. Washington, DC: National Academies Press.

Chapman, G. B., & Coups, E. J. (2006). Emotions and preventive health behavior: Worry, regret, and influenza vaccination. *Health Psychology*, **25**(1), 82–90. doi:10.1037/0278-6133.25.1.82

Charles, S. T. (2010). Strength and vulnerability integration: A model of emotional well-being across adulthood. *Psychological Bulletin*, **136**(6), 1068–1091. doi:10.1037/a0021232

Cheng, C., Wong, W. M., & Tsang, K. W. (2006). Perception of benefits and costs during SARS outbreak: An 18-month prospective study. *Journal of Consulting and Clinical Psychology*, **74**(5), 870–879. doi:10.1037/0022-006X.74.5.870

Crittendon, J., & Hopko, D. R. (2006). Assessing worry in older and younger adults: Psychometric properties of an abbreviated Penn State Worry Questionnaire (PSWQ-A). *Journal of Anxiety Disorders*, **20**(8), 1036–1054. doi:10.1016/j.janxdis.2005.11.006

Crosby, R., Bonney, E. A., & Odenat, L. (2004). Correlates of intent for repeat HIV testing among low-income women attending an urgent care clinic in the urban south. *Public Health Nursing (Boston, Mass.)*, **21**(5), 419–424. doi:10.1111/j.0737-1209.2004.21505.x

Dijkstra, A., & Brosschot, J. (2003). Worry about health in smoking behaviour change. *Behaviour Research and Therapy*, **41**(9), 1081–1092. doi:10.1016/s0005-7967(02)00244-9

Gerolimatos, L. A., & Edelstein, B. A. (2012). Anxiety-related constructs mediate the relation between age and health anxiety. *Aging & Mental Health*, **16**(8), 975–982. doi:10.1080/13607863.2012.688192

Golden, J., Conroy, R. M., Bruce, I., Denihan, A., Greene, E., Kirby, M., & Lawlor, B. A. (2011). The spectrum of worry in the community-dwelling elderly. *Aging & Mental Health*, **15**(8), 985–994. doi:10.1080/13607863.2011.583621

Gould, C. E., & Edelstein, B. A. (2010). Worry, emotion control, and anxiety control in older and young adults. *Journal of Anxiety Disorders*, **24**(7), 759–766. doi:10.1016/j.janxdis.2010.05.009

Gould, C. E., Gerolimatos, L. A., & Edelstein, B. A. (2015). Experimental examination of worry among older and young adults. *International Psychogeriatrics*, **27**(7), 1177–1190. doi:10.1017/S1041610214000891

Harper, C. A., Satchell, L. P., Fido, D., & Latzman, R. D. (2020). Functional fear predicts public health compliance in the COVID-19 pandemic. *International Journal of Mental Health and Addiction*, **1**. doi:10.1007/s11469-020-00281-5

Hay, J. L., McCaul, K. D., & Magnan, R. E. (2006). Does worry about breast cancer predict screening behaviors? A meta-analysis of the prospective evidence. *Preventive Medicine*, **42**(6), 401–408. doi:10.1016/j.ypmed.2006.03.002

Hunt, S., Wisocki, P., & Yanko, J. (2003). Worry and use of coping strategies among older and younger adults. *Journal of Anxiety Disorders*, **17**(5), 547–560. doi:10.1016/s0887-6185(02)00229-3

KFF. (2020). State data and policy actions to address coronavirus. Retrieved from https://www.kff.org/wp-content/uploads/2020/04/Figure-State-Actions-by-Date.png

Kubzansky, L. D., Kawachi, I., Spiro, A. III, Weiss, S. T., Vokonas, P. S., & Sparrow, D. (1997). Is worrying bad for your heart? A prospective study of worry and coronary heart disease in the Normative Aging Study. *Circulation*, **95**(4), 818–824. doi:10.1161/01.cir.95.4.818

Lau, J. T., Yang, X., Tsui, H. Y., & Kim, J. H. (2005). Impacts of SARS on health-seeking behaviors in general population in Hong Kong. *Preventive Medicine*, **41**(2), 454–462. doi:10.1016/j.ypmed.2004.11.023

McCaul, K. D., & Mullens, A. B. (2003). Affect, though, and self-protective health behavior: The case of worry and cancer screening. *Social Psychological Foundations of Health and Illness*, **1**, 137–168. doi:10.1002/9780470753552.ch6

Pietzak, R. H., Maruff, P., Woodward, M., Fredrickson, J., Fredrickson, A., Krystal, J. H.,…Darby, D. (2012). Mild worry symptoms predict decline in learning and memory in healthy older adults: A 2-year prospective cohort study. *The American Journal of Geriatric Psychiatry*, **20**(3), 266–275. doi:10.1097/JGP.0b013e3182107e24

Puterman, E., DeLongis, A., Lee-Baggley, D., & Greenglass, E. (2009). Coping and health behaviours in times of global health crises: Lessons from SARS and West Nile. *Global Public Health*, **4**(1), 69–81. doi:10.1080/17441690802063304

Remuzzi, A., & Remuzzi, G. (2020). COVID-19 and Italy: What next? *The Lancet*, **395**, 1225–1228. doi:10.1016/S0140-6736(20)30627-9.

Russac, R. J., Gatliff, C., Reece, M., & Spottswood, D. (2007). Death anxiety across the adult years: An examination of age and gender effects. *Death Studies*, **31**(6), 549–561. doi:10.1080/07481180701356936

Scott, S. B., Poulin, M. J., & Silver, R. C. (2013). A lifespan perspective on terrorism: Age differences in trajectories of response to 9/11. *Developmental Psychology*, **49**(5), 986–998. doi:10.1037/a0028916

Shrira, A., Palgi, Y., Hamama-Raz, Y., Goodwin, R., & Ben-Ezra, M. (2014). Previous exposure to the World Trade Center terrorist attack and posttraumatic symptoms among older adults following Hurricane Sandy. *Psychiatry*, **77**(4), 374–385. doi:10.1521/psyc.2014.77.4.374

Wong, T. W., Gao, Y., & Tam, W. W. S. (2007). Anxiety among university students during the SARS epidemic in Hong Kong. *Stress and Health*, **23**(1), 31–35. doi:10.1002/smi.1116

Wu, Z., & McGoogan, J. M. (2020). Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China. *JAMA*, **323**, 1239–1242. doi:10.1001/jama.2020.2648

Yeung, D. Y., & Fung, H. H. (2007). Age differences in coping and emotional responses toward SARS: A longitudinal study of Hong Kong Chinese. *Aging & Mental Health*, **11**(5), 579–587. doi:10.1080/13607860601086355