Supplemental Online Material

Increased COVID-19-related fear and subjective risk perception regarding COVID-19 affects behaviour in individuals with internal high-risk diseases

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Supplemental Analyses

Marginal effects and regression analyses

In our main analyses, we reported univariate ANOVAs for the sake of simplicity and parsimony. F-values only indicate whether differences between groups exist in an analysis. Single group comparisons (so-called post hoc or marginal effects) must follow to draw conclusions about which of the groups differ from each other.

Furthermore, the reported differences might also result from an uneven distribution of participant characteristics. In order to assess if our results remain robust against such imbalances, we performed linear regression analyses with gender and age as covariates for each of the reported differences in the main manuscript. Marginal effects of the original omnibus-ANOVAs and the linear regression analyses are reported and compared in supplemental tables 1a-1n. The overall pattern from the ANOVAs can be reproduced in the linear regression analyses; only a few estimates differ, as highlighted in yellow color. Hence, conditioning on age on gender appears to leave the results unaffected.

Table 1a. Comparisons of marginal effects between ANOVA and regression / Health Status (healthy vs one risk disease vs two risk diseases vs multimorbid) on Fear of COVID-19

	Fear of COVID-19			
	ANOVA Estimate	Linear Regression Estimate	ANOVA P-Value	Linear Regression P-Value
One Risk Disease vs Healthy	0.31	0.26	<.001	<.001
One Risk Disease vs Multimorbid	-0.25	-0.22	0.299	0.406
One Risk Disease vs Two Diseases	-0.27	-0.26	0.005	0.007
Healthy vs Multimorbid	-0.57	-0.48	<.001	0.004
Healthy vs Two Diseases	-0.58	-0.52	<.001	<.001
Multimorbid vs Two Diseases	-0.01	-0.03	1.000	0.996

Table 1b. Comparisons of marginal effects between ANOVA and regression / Health Status (healthy vs one risk disease vs two risk diseases vs multimorbid) on Generalized Anxiety

	Generalized Anxiety (GAD-7)			
	ANOVA Estimate	Linear Regression Estimate	ANOVA P-Value	Linear Regression P-Value
One Risk Disease vs Healthy	0.24	0.78	0.072	<.001
One Risk Disease vs Multimorbid	-0.76	-1.27	0.212	0.005
One Risk Disease vs Two Diseases	-0.02	-0.40	1.000	0.244
Healthy vs Multimorbid	-1.00	-2.04	0.045	<.001
Healthy vs Two Diseases	-0.26	-1.18	0.564	<.001
Multimorbid vs Two Diseases	0.74	0.87	0.316	0.167

Table 1c. Comparisons of marginal effects between ANOVA and regression / Health Status (healthy vs one risk disease vs two risk diseases vs multimorbid) on Adherent Safety Behavior

	Adherent Safety Behavior			
	ANOVA Estimate	Linear Regression Estimate	ANOVA P-Value	Linear Regression P-Value
One Risk Disease vs Healthy	0.20	0.11	<.001	0.005
One Risk Disease vs Multimorbid	-0.33	-0.22	0.047	0.273
One Risk Disease vs Two Diseases	-0.18	-0.13	0.049	0.225
Healthy vs Multimorbid	-0.53	-0.33	<.001	0.034
Healthy vs Two Diseases	-0.38	-0.24	<.001	0.001
Multimorbid vs Two Diseases	0.15	0.09	0.721	0.908

Table 1d. Comparisons of marginal effects between ANOVA and regression / Health Status (healthy vs one risk disease vs two risk diseases vs multimorbid) on Dysfunctional Safety Behavior

	Dysfunctional Safety Behavior			
	ANOVA Estimate	Linear Regression Estimate	ANOVA P-Value	Linear Regression P-Value
One Risk Disease vs Healthy	0.17	0.12	<.001	<.001
One Risk Disease vs Multimorbid	-0.28	-0.23	0.033	0.107
One Risk Disease vs Two Diseases	-0.14	-0.11	0.076	0.207
Healthy vs Multimorbid	-0.45	-0.35	<.001	0.003
Healthy vs Two Diseases	-0.31	-0.23	<.001	<.001
Multimorbid vs Two Diseases	0.14	0.12	0.593	0.708

Table 1e. Comparisons of marginal effects between ANOVA and regression / Health Status (healthy vs one risk disease vs two risk diseases vs multimorbid) on the risk to suffer from symptoms in case of a COVID-19 infection

	Subjective Risk Perception / Symptoms in Case of COVID-19 Infection			
	ANOVA Estimate	Linear Regression Estimate	ANOVA P-Value	Linear Regression P-Value
One Risk Disease vs Healthy	8.82	8.35	<.001	<.001
One Risk Disease vs Multimorbid	-9.24	-8.73	<.001	<.001
One Risk Disease vs Two Diseases	-6.35	-6.03	<.001	<.001
Healthy vs Multimorbid	-18.05	-17.07	<.001	<.001
Healthy vs Two Diseases	-15.17	-14.38	<.001	<.001
Multimorbid vs Two Diseases	2.89	2.70	0.555	0.610

Table 1f. Comparisons of marginal effects between ANOVA and regression / Health Status (healthy vs one risk disease vs two risk diseases vs multimorbid) on the risk to suffer of a severe course in case of a COVID-19 infection

	Subjective Risk Perception / Suffering of a severe Course in Case of Infection			
	ANOVA Estimate	Linear Regression Estimate	ANOVA P-Value	Linear Regression P-Value
One Risk Disease vs Healthy	15.19	12.78	<.001	<.001
One Risk Disease vs Multimorbid	-22.13	-19.76	<.001	<.001
One Risk Disease vs Two Diseases	-13.74	-12.11	<.001	<.001
Healthy vs Multimorbid	-37.33	-32.54	<.001	<.001
Healthy vs Two Diseases	-28.93	-24.89	<.001	<.001
Multimorbid vs Two Diseases	8.39	7.66	<.001	<.001

Table 1g. Comparisons of marginal effects between ANOVA and regression / Health Status (healthy vs one risk disease vs two risk diseases vs multimorbid) on the risk to die in case of a COVID-19 infection

| | Subjective Risk Perception / Dying in Case of an Infection | | | |
| | ANOVA | Linear Regression | ANOVA | Linear Regression |
	Estimate	Estimate	P-Value	P-Value
One Risk Disease vs Healthy	9.45	7.68	0.000	0.000
One Risk Disease vs Multimorbid	-23.09	-21.06	0.000	0.000
One Risk Disease vs Two Diseases	-11.07	-9.72	0.000	0.000
Healthy vs Multimorbid	-32.54	-28.75	0.000	0.000
Healthy vs Two Diseases	-20.52	-17.40	0.000	0.000
Multimorbid vs Two Diseases	12.02	11.35	0.000	0.000

Table 1h. Comparisons of marginal effects between ANOVA and regression / Type of Disease (healthy vs diabetes mellitus vs hypertonia vs chronic pulmonary disease vs cardiovascular diseases vs multimorbid) on Fear of COVID-19

| | Fear of COVID-19 | | | |
| | ANOVA | Linear Regression | ANOVA | Linear Regression |
	Estimate	Estimate	P-Value	P-Value
Healthy vs Multimorbid	-0.58	-0.50	< .001	< .001
Healthy vs Arterial Hypertonia	-0.26	-0.20	< .001	0.001
Healthy vs Chronic Pulmonary Diseases	-0.42	-0.35	< .001	0.000
Healthy vs Diabetes Mellitus	0.00	0.02	1.000	1.000
Healthy vs Cardiovascular Diseases	-0.47	-0.45	0.003	0.005
Multimorbid vs Arterial Hypertonia	0.32	0.31	0.001	0.001
Multimorbid vs Chronic Pulmonary Diseases	0.16	0.15	0.414	0.507
Multimorbid vs Diabetes Mellitus	0.58	0.52	0.001	0.005
Multimorbid vs Cardiovascular Diseases	0.11	0.05	0.973	0.999
Arterial Hypertonia vs Chronic Pulmonary Diseases	-0.16	-0.16	0.275	0.251
Arterial Hypertonia vs Diabetes Mellitus	0.26	0.22	0.431	0.629
Arterial Hypertonia vs Cardiovascular Diseases	-0.21	-0.25	0.632	0.392
Chronic Pulmonary Diseases vs Diabetes Mellitus	0.42	0.37	0.046	0.092
Chronic Pulmonary Diseases vs Cardiovascular Diseases	-0.05	-0.10	0.999	0.981
Diabetes Mellitus vs Cardiovascular Diseases	-0.47	-0.47	0.107	0.097

Table 1i. Comparisons of marginal effects between ANOVA and regression / Type of Disease (healthy vs diabetes mellitus vs hypertonia vs chronic pulmonary disease vs cardiovascular diseases vs multimorbid) on Generalized Anxiety

| | Generalized Anxiety (GAD-7) | | | |
| | ANOVA | Linear Regression | ANOVA | Linear Regression |
	Estimate	Estimate	P-Value	P-Value
Healthy vs Multimorbid	-0.42	-1.34	0.182	< .001
Healthy vs Arterial Hypertonia	0.39	-0.37	0.037	0.063
Healthy vs Chronic Pulmonary Diseases	-1.18	-1.30	< .001	< .001
Healthy vs Diabetes Mellitus	0.37	-0.12	0.915	1.000
Healthy vs Cardiovascular Diseases	-0.76	-1.53	0.230	0.000
Multimorbid vs Arterial Hypertonia	0.81	0.96	0.002	< .001
Multimorbid vs Chronic Pulmonary Diseases	-0.76	0.04	0.014	1.000
Multimorbid vs Diabetes Mellitus	0.79	1.22	0.359	0.023
Multimorbid vs Cardiovascular Diseases	-0.34	-0.19	0.951	0.996
Arterial Hypertonia vs Chronic Pulmonary Diseases	-1.58	-0.93	< .001	< .001
Arterial Hypertonia vs Diabetes Mellitus	-0.03	0.26	1.000	0.983
Arterial Hypertonia vs Cardiovascular Diseases	-1.15	-1.16	0.019	0.014
Chronic Pulmonary Diseases vs Diabetes Mellitus	1.55	1.18	0.001	0.024
Chronic Pulmonary Diseases vs Cardiovascular Diseases	0.42	-0.23	0.866	0.989
Diabetes Mellitus vs Cardiovascular Diseases	-1.13	-1.41	0.204	0.041

Table 1j. Comparisons of marginal effects between ANOVA and regression / Type of Disease (healthy vs diabetes mellitus vs hypertonia vs chronic pulmonary disease vs cardiovascular diseases vs multimorbid) on Adherent Safety Behavior

| | Adherent Safety Behavior | | | |
| | ANOVA | Linear Regression | ANOVA | Linear Regression |
	Estimate	Estimate	P-Value	P-Value
Healthy vs Multimorbid	-0.41	-0.26	< .001	< .001
Healthy vs Arterial Hypertonia	-0.21	-0.08	< .001	0.370
Healthy vs Chronic Pulmonary Diseases	-0.21	-0.15	0.001	0.030
Healthy vs Diabetes Mellitus	0.00	0.05	1.000	0.999
Healthy vs Cardiovascular Diseases	-0.27	-0.19	0.140	0.499
Multimorbid vs Arterial Hypertonia	0.21	0.17	0.039	0.114
Multimorbid vs Chronic Pulmonary Diseases	0.20	0.11	0.075	0.706
Multimorbid vs Diabetes Mellitus	0.41	0.30	0.019	0.157
Multimorbid vs Cardiovascular Diseases	0.14	0.07	0.861	0.994
Arterial Hypertonia vs Chronic Pulmonary Diseases	0.00	-0.07	1.000	0.898
Arterial Hypertonia vs Diabetes Mellitus	0.21	0.13	0.549	0.888
Arterial Hypertonia vs Cardiovascular Diseases	-0.06	-0.11	0.995	0.941
Chronic Pulmonary Diseases vs Diabetes Mellitus	0.21	0.20	0.567	0.601

	ANOVA Estimate	Linear Regression Estimate	ANOVA P-Value	Linear Regression P-Value
Chronic Pulmonary Diseases vs Cardiovascular Diseases	-0.06	-0.04	0.996	0.999
Diabetes Mellitus vs Cardiovascular Diseases	-0.27	-0.24	0.545	0.659

Table 1k. Comparisons of marginal effects between ANOVA and regression / Type of Disease (healthy vs diabetes mellitus vs hypertonia vs chronic pulmonary disease vs cardiovascular diseases vs multimorbid) on Dysfunctional Safety Behavior

	Dysfunctional Safety Behavior			
	ANOVA	Linear Regression	ANOVA	Linear Regression
	Estimate	Estimate	P-Value	P-Value
Healthy vs Multimorbid	-0.34	-0.25	< .001	< .001
Healthy vs Arterial Hypertonia	-0.15	-0.08	< .001	0.274
Healthy vs Chronic Pulmonary Diseases	-0.17	-0.14	< .001	0.009
Healthy vs Diabetes Mellitus	-0.17	-0.12	0.488	0.794
Healthy vs Cardiovascular Diseases	-0.34	-0.29	0.002	0.013
Multimorbid vs Arterial Hypertonia	0.19	0.18	0.010	0.021
Multimorbid vs Chronic Pulmonary Diseases	0.17	0.11	0.069	0.442
Multimorbid vs Diabetes Mellitus	0.17	0.13	0.571	0.803
Multimorbid vs Cardiovascular Diseases	0.00	-0.04	1.000	0.999
Arterial Hypertonia vs Chronic Pulmonary Diseases	-0.02	-0.06	0.997	0.817
Arterial Hypertonia vs Diabetes Mellitus	-0.02	-0.04	1.000	0.998
Arterial Hypertonia vs Cardiovascular Diseases	-0.20	-0.22	0.306	0.190
Chronic Pulmonary Diseases vs Diabetes Mellitus	0.01	0.02	1.000	1.000
Chronic Pulmonary Diseases vs Cardiovascular Diseases	-0.17	-0.15	0.495	0.611
Diabetes Mellitus vs Cardiovascular Diseases	-0.18	-0.17	0.748	0.760

Table 1l. Comparisons of marginal effects between ANOVA and regression / Type of Disease (healthy vs diabetes mellitus vs hypertonia vs chronic pulmonary disease vs cardiovascular diseases vs multimorbid) on the risk to suffer from symptoms in case of a COVID-19 infection

	Subjective Risk Perception / Symptoms in Case of COVID-19 Infection			
	ANOVA	Linear Regression	ANOVA	Linear Regression
	Estimate	Estimate	P-Value	P-Value
Healthy vs Multimorbid	-15.79	-14.66	< .001	< .001
Healthy vs Arterial Hypertonia	-5.49	-4.67	< .001	< .001
Healthy vs Chronic Pulmonary Diseases	-14.30	-13.91	< .001	< .001
Healthy vs Diabetes Mellitus	-4.99	-4.58	0.075	0.130
Healthy vs Cardiovascular Diseases	-9.40	-8.66	< .001	< .001
Multimorbid vs Arterial Hypertonia	10.29	9.99	< .001	< .001
Multimorbid vs Chronic Pulmonary Diseases	1.49	0.75	0.813	0.989
Multimorbid vs Diabetes Mellitus	10.79	10.07	< .001	< .001
Multimorbid vs Cardiovascular Diseases	6.38	6.00	0.014	0.027
Arterial Hypertonia vs Chronic Pulmonary Diseases	-8.80	-9.24	< .001	< .001
Arterial Hypertonia vs Diabetes Mellitus	0.50	0.08	1.000	1.000
Arterial Hypertonia vs Cardiovascular Diseases	-3.91	-3.99	0.282	0.259
Chronic Pulmonary Diseases vs Diabetes Mellitus	9.30	9.32	< .001	< .001
Chronic Pulmonary Diseases vs Cardiovascular Diseases	4.90	5.25	0.105	0.066
Diabetes Mellitus vs Cardiovascular Diseases	-4.41	-4.08	0.503	0.590

Table 1m. Comparisons of marginal effects between ANOVA and regression / Type of Disease (healthy vs diabetes mellitus vs hypertonia vs chronic pulmonary disease vs cardiovascular diseases vs multimorbid) on the risk to suffer of a severe course in case of a COVID-19 infection

	Subjective Risk Perception / Suffering of a severe Course in Case of Infection			
	ANOVA	Linear Regression	ANOVA	Linear Regression
	Estimate	Estimate	P-Value	P-Value
Healthy vs Multimorbid	-30.74	-26.08	< .001	< .001
Healthy vs Arterial Hypertonia	-10.13	-6.52	< .001	< .001
Healthy vs Chronic Pulmonary Diseases	-21.91	-20.57	< .001	< .001
Healthy vs Diabetes Mellitus	-12.83	-11.05	< .001	< .001
Healthy vs Cardiovascular Diseases	-21.20	-17.93	< .001	< .001
Multimorbid vs Arterial Hypertonia	20.60	19.56	< .001	< .001
Multimorbid vs Chronic Pulmonary Diseases	8.83	5.51	< .001	< .001
Multimorbid vs Diabetes Mellitus	17.91	15.03	< .001	< .001
Multimorbid vs Cardiovascular Diseases	9.54	8.15	< .001	< .001
Arterial Hypertonia vs Chronic Pulmonary Diseases	-11.78	-14.05	< .001	< .001
Arterial Hypertonia vs Diabetes Mellitus	-2.69	-4.53	0.640	0.089
Arterial Hypertonia vs Cardiovascular Diseases	-11.07	-11.41	< .001	< .001
Chronic Pulmonary Diseases vs Diabetes Mellitus	9.08	9.52	< .001	< .001
Chronic Pulmonary Diseases vs Cardiovascular Diseases	0.71	2.64	0.998	0.621
Diabetes Mellitus vs Cardiovascular Diseases	-8.37	-6.88	0.003	0.025

Table 1n. Comparisons of marginal effects between ANOVA and regression / Type of Disease (healthy vs diabetes mellitus vs hypertonia vs chronic pulmonary disease vs cardiovascular diseases vs multimorbid) on the risk to die in case of a COVID-19 infection

Subjective Risk Perception / Dying in Case of an Infection

	ANOVA Estimate	Linear Regression Estimate	ANOVA P-Value	Linear Regression P-Value
Healthy vs Multimorbid	-23.10	-19.54	< .001	< .001
Healthy vs Arterial Hypertonia	-6.10	-3.49	< .001	< .001
Healthy vs Chronic Pulmonary Diseases	-13.23	-12.30	< .001	< .001
Healthy vs Diabetes Mellitus	-9.47	-8.20	< .001	< .001
Healthy vs Cardiovascular Diseases	-15.28	-12.67	< .001	< .001
Multimorbid vs Arterial Hypertonia	16.99	16.05	< .001	< .001
Multimorbid vs Chronic Pulmonary Diseases	9.87	7.24	< .001	< .001
Multimorbid vs Diabetes Mellitus	13.63	11.34	< .001	< .001
Multimorbid vs Cardiovascular Diseases	7.81	6.87	< .001	< .001
Arterial Hypertonia vs Chronic Pulmonary Diseases	-7.12	-8.81	< .001	< .001
Arterial Hypertonia vs Diabetes Mellitus	-3.37	-4.70	0.180	0.012
Arterial Hypertonia vs Cardiovascular Diseases	-9.18	-9.18	0.000	< .001
Chronic Pulmonary Diseases vs Diabetes Mellitus	3.75	4.10	0.113	0.055
Chronic Pulmonary Diseases vs Cardiovascular Diseases	-2.06	-0.37	0.692	1.000
Diabetes Mellitus vs Cardiovascular Diseases	-5.81	-4.47	0.024	0.150