Supplementary Material

Mental Health and Quality of Life among Patients with Cancer during the SARS-CoV-2 Pandemic: Results from the   
Longitudinal ONCOVID Survey Study

**Emiel A. De Jaeghere 1,2,\*, Heini Kanervo 1, Roos Colman 3, Wim Schrauwen 4, Paulien West 5, Nele Vandemaele 5, Aglaja De Pauw 1, Celine Jacobs 1, Ingeborg Hilderson 1, Michael Saerens 1, Nora Sundahl 2,6,   
Katrien Vandecasteele 2,6, Eline Naert 1,2, Lore Lapeire 1,2, Vibeke Kruse 2,7, Sylvie Rottey 1,2, Gilbert Lemmens 8   
and Hannelore G. Denys 1,2**

1 Medical Oncology, Ghent University Hospital, 9000 Ghent, Belgium; [heini.kanervo@uzgent.be](mailto:heini.kanervo@uzgent.be) (H.K.);   
[aglaja.depauw@ugent.be](mailto:aglaja.depauw@ugent.be) (A.D.P.); [celine.jacobs@uzgent.be](mailto:celine.jacobs@uzgent.be) (C.J.); [ingeborg.hilderson@uzgent.be](mailto:ingeborg.hilderson@uzgent.be) (I.H.);   
[michael.saerens@ugent.be](mailto:michael.saerens@ugent.be) (M.S.); [eline.naert@ugent.be](mailto:eline.naert@ugent.be) (E.N.); [lore.lapeire@uzgent.be](mailto:lore.lapeire@uzgent.be) (L.L.);   
[sylvie.rottey@ugent.be](mailto:sylvie.rottey@ugent.be) (S.R.); [hannelore.denys@ugent.be](mailto:hannelore.denys@ugent.be) (H.G.D.)

2 Cancer Research Institute Ghent (CRIG), 9000 Ghent, Belgium; [nora.sundahl@ugent.be](mailto:nora.sundahl@ugent.be) (N.S.);   
[katrien.vandecasteele@ugent.be](mailto:katrien.vandecasteele@ugent.be) (K.V.); [vibeke.kruse@ugent.be](mailto:vibeke.kruse@ugent.be) (V.K.)

3 Biostatistics Unit, Faculty of Medicine and Life Sciences, Ghent University, 9000 Ghent, Belgium;   
[roos.colman@ugent.be](mailto:roos.colman@ugent.be)

4 Medical Psychology, Ghent University Hospital, 9000 Ghent, Belgium; [wim.schrauwen@uzgent.be](mailto:wim.schrauwen@uzgent.be)

5 Faculty of Medicine and Life Sciences, Ghent University, 9000 Ghent, Belgium; [paulien.west@ugent.be](mailto:paulien.west@ugent.be) (P.W.);   
[nele.vandemaele@ugent.be](mailto:nele.vandemaele@ugent.be) (N.V.)

6 Radiotherapy, Ghent University Hospital, 9000 Ghent, Belgium

Medical Oncology, General Hospital Sint-Nikolaas, 9100 Sint-Niklaas, Belgium

8 Psychiatry, Ghent University Hospital, 9000 Ghent, Belgium; [gilbert.lemmens@ugent.be](mailto:gilbert.lemmens@ugent.be)

**\*** Correspondence: emiel.dejaeghere@ugent.be; Tel.: +32-9-332-26-92

Chart, box and whisker chart

Description automatically generated

**Figure S1.** Study timeline.



**Figure S2.** Correlation matrix.

Pearson correlation coefficients between the different scores.

**Table S1.** Summary of descriptive statistics of scores at T0 and minimal important difference.

|  |  |  |
| --- | --- | --- |
| **Variable** | **Mean (SD) at Baseline** | **MID** |
| **CPDI** |  |  |
| Peritraumatic distress | 26.86 (13.08) | 6.54 |
| **DASS-21** |  |  |
| Depression | 3.14 (3.69) | 1.85 |
| Anxiety | 2.37 (2.88) | 1.44 |
| Stress | 3.47 (3.63) | 1.82 |
| **WHOQOL-BREF** |  |  |
| Physical health | 63.51 (18.83) | 9.42 |
| Psychological health | 64.11 (14.88) | 7.44 |
| Social relationships | 69.43 (16.08) | 8.04 |
| Environmental health | 75.40 (13.94) | 6.96 |
| Overall QOL and general health | 6.59 (1.59) | 0.80 |

MID—minimal important difference; QOL—quality of life; CPDI—COVID-19 Peritraumatic Distress Index; SD—standard deviation

**Table S2.** Corresponding numerical values Figures 2 and 3.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Survey Period** | | | |
| **Variable** | **T0** | **T1** | **T2** | **T3** |
| **Peritraumatic distress** |  |  |  |  |
| Normal | 60.3% | 62.9% | 64.5% | 65.9% |
| Moderate | 35.3% | 31.5% | 32.4% | 30.5% |
| Severe | 4.3% | 5.6% | 3.1% | 3.7% |
| **Depression** |  |  |  |  |
| Normal | 72.4% | 67.1% | 66.4% | 68.5% |
| Mild | 13.5% | 10.0% | 12.2% | 13.7% |
| Moderate | 7.5% | 16.9% | 12.2% | 12.4% |
| Severe | 4.2% | 2.5% | 5.9% | 3.3% |
| Extremely severe | 2.4% | 3.5% | 3.2% | 2.1% |
| **Anxiety** |  |  |  |  |
| Normal | 75.1% | 67.7% | 67.4% | 72.2% |
| Mild | 12.3% | 15.7% | 12.2% | 12.0% |
| Moderate | 6.6% | 8.5% | 10.8% | 8.3% |
| Severe | 2.4% | 3.5% | 4.9% | 4.2% |
| Extremely severe | 3.6% | 4.7% | 4.9% | 3.3% |
| **Stress** |  |  |  |  |
| Normal | 88.6% | 85.0% | 84.3% | 85.5% |
| Mild | 3.3% | 6.3% | 8.0% | 5.4% |
| Moderate | 4.8% | 5.0% | 4.2% | 5.8% |
| Severe | 3.0% | 3.5% | 3.2% | 2.9% |
| Extremely severe | 0.3% | 0.3% | 0.4% | 0.4% |

Percentages may not total 100% due to rounding.

**Table S3.** Corresponding datapoints Figure 4.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Survey Period** | | | |
| **Variable** | **T0** | **T1** | **T2** | **T3** |
| **Mental health** |  |  |  |  |
| Peritraumatic distress  (0–100) | 26.94 (25.58 to 28.30) | 25.77 (24.32 to 27.22) | 24.28 (22.84 to 25.73) | 24.89 (23.35 to 26.43) |
| Depression (0–21) | 3.27 (2.87 to 3.67) | 3.68 (3.26 to 4.11) | 3.61 (3.16 to 4.06) | 3.78 (3.33 to 4.23) |
| Anxiety (0–21) | 2.42 (2.11 to 2.74) | 2.90 (2.57 to 3.24) | 2.86 (2.51 to 3.20) | 2.87 (2.50 to 3.23) |
| Stress (0–21) | 3.53 (3.15 to 3.92) | 3.81 (3.41 to 4.22) | 3.89 (3.49 to 4.29) | 4.03 (3.59 to 4.47 |
| **Quality of life** |  |  |  |  |
| Physical health (0–100) | 63.50 (61.55 to 65.46) | 62.10 (60.08 to 64.13) | 61.86 (59.76 to 63.96) | 61.39 (59.16 to 63.61) |
| Psychological health (0–100) | 64.11 (62.54 to 65.67) | 62.63 (60.95 to 64.31) | 63.30 (61.61 to 65.00) | 62.52 (60.68 to 64.37) |
| Social relationships (0–100) | 69.19 (67.50 to 70.88) | 67.06 (65.31 to 68.81) | 67.11 (65.31 to 68.92) | 65.44 (63.32 to 67.55) |
| Environment (0–100) | 75.39 (73.95 to 76.83) | 74.54 (73.02 to 76.06) | 74.67 (73.09 to 76.25) | 74.05 (72.35 to 75.74) |
| Overall QOL and general health (0–10) | 6.58 (6.42 to 6.74) | 6.47 (6.30 to 6.64) | 6.58 (6.34 to 6.81) | 6.69 (6.02 to 7.36) |

Data are expressed as mean with 95% confidence interval (CI). QOL—quality of life.

**Table S4.** Bivariate associations between characteristics of the participants and mental health scores.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Mental Health Scores** | | | | | | | |
|  | **CPDI** | | **DASS-21** | | | | | |
| **Variable** | **Peritraumatic distress**  **(0–100)** | ***p* Value** | **Depression**  **(0–21)** | ***p* Value** | **Anxiety**  **(0–21)** | ***p* Value** | **Stress**  **(0–21)** | ***p* Value** |
| **Age** | −0.03 (−0.13 to 0.07) | 0.571 | −0.01 (−0.04 to 0.02) | 0.616 | 0.01 (−0.01 to 0.03) | 0.317 | −0.01 (−0.04 to 0.01) | 0.289 |
| **Gender** |  | 0.091 |  | 0.839 |  | 0.001 |  | 0.950 |
| Female | 26.16 (24.64 to 27.69) |  | 3.56 (3.11 to 4.01) |  | 2.47 (2.13 to 2.81) |  | 3.83 (3.41 to 4.24) |  |
| Male | 23.72 (21.31 to 26.13) |  | 3.65 (2.95 to 4.35) |  | 3.48 (2.95 to 4.01) |  | 3.80 (3.15 to 4.45) |  |
| **Educational level** |  | 0.117 |  | 0.701 |  | 0.068 |  | 0.684 |
| Fundamental or secondary | 26.41 (24.58 to 28.24) |  | 3.61 (3.07 to 4.15) |  | 3.02 (2.60 to 3.43) |  | 3.87 (3.38 to 4.36) |  |
| Higher education | 24.36 (22.53 to 26.19) |  | 3.46 (2.93 to 4.00) |  | 2.48 (2.07 to 2.89) |  | 3.73 (3.24 to 4.22) |  |
| **Marital status** |  | 0.466 |  | 0.539 |  | 0.622 |  | 0.872 |
| Single or never married | 24.31 (20.43 to 28.20) |  | 3.77 (2.63 to 4.90) |  | 2.99 (2.13 to 3.85) |  | 3.58 (2.53 to 4.63) |  |
| Married or living as married | 25.33 (23.81 to 26.85) |  | 3.46 (3.02 to 3.91) |  | 2.69 (2.35 to 3.03) |  | 3.88 (3.46 to 4.29) |  |
| Divorced, separated, or widowed | 27.24 (24.00 to 30.47) |  | 4.03 (3.08 to 4.98) |  | 3.02 (2.29 to 3.75) |  | 3.87 (2.99 to 4.75) |  |
| **Household composition** |  | 0.555 |  | 0.102 |  | 0.032 |  | 0.938 |
| Living with others | 25.31 (23.86 to 26.76) |  | 3.45 (3.02 to 3.87) |  | 2.63 (2.30 to 2.95) |  | 3.84 (3.45 to 4.23) |  |
| Living alone | 26.30 (23.33 to 29.28) |  | 4.25 (3.38 to 5.12) |  | 3.42 (2.77 to 4.08) |  | 3.88 (3.08 to 4.68) |  |
| **Cancer type** |  | 0.430 |  | 0.379 |  | 0.080 |  | 0.846 |
| Breast | 26.55 (24.60 to 28.50) |  | 3.59 (3.02 to 4.17) |  | 2.64 (2.20 to 3.07) |  | 3.88 (3.35 to 4.41) |  |
| Genitourinary | 24.30 (21.05 to 27.54) |  | 4.06 (3.12 to 5.01) |  | 3.34 (2.63 to 4.05) |  | 3.97 (3.09 to 4.84) |  |
| Gynecological | 25.98 (22.58 to 29.38) |  | 3.35 (2.36 to 4.34) |  | 2.31 (1.56 to 3.05) |  | 4.07 (3.15 to 4.99) |  |
| Melanoma | 22.10 (18.56 to 25.65) |  | 2.64 (1.61 to 3.67) |  | 2.21 (1.43 to 2.99) |  | 3.37 (2.41 to 4.32) |  |
| Head and neck | 25.74 (20.50 to 30.98) |  | 3.79 (2.23 to 5.35) |  | 3.91 (2.72 to 5.10) |  | 3.23 (1.77 to 4.68) |  |
| Soft tissue and bone | 27.88 (21.60 to 34.17) |  | 4.69 (2.92 to 6.47) |  | 3.57 (2.23 to 4.90) |  | 4.36 (2.71 to 6.00) |  |
| Other | 24.47 (17.47 to 31.46) |  | 4.20 (2.17 to 6.23) |  | 2.78 (1.26 to 4.30) |  | 3.28 (1.40 to 5.16) |  |
| **Therapy intention** |  | 0.926 |  | 0.432 |  | 0.600 |  | 0.757 |
| Palliative | 25.50 (24.04 to 26.97) |  | 3.67 (3.24 to 4.09) |  | 2.80 (2.47 to 3.13) |  | 3.85 (3.45 to 4.24) |  |
| Curative | 25.36 (22.58 to 28.13) |  | 3.30 (2.49 to 4.11) |  | 2.62 (2.00 to 3.23) |  | 3.71 (2.97 to 4.46) |  |
| **Estimated life expectancy** |  | 0.178 |  | 0.071 |  | <0.001 |  | 0.476 |
| >1 year | 25.00 (23.53 to 26.47) |  | 3.40 (2.97 to 3.83) |  | 2.49 (2.17 to 2.82) |  | 3.75 (3.35 to 4.15) |  |
| ≤1 year | 27.08 (24.40 to 29.77) |  | 4.22 (3.43 to 5.00) |  | 3.68 (3.09 to 4.28) |  | 4.05 (3.32 to 4.77) |  |
| **Therapy change** |  | 0.387 |  | 0.341 |  | 0.100 |  | 0.166 |
| Yes | 23.92 (20.16 to 27.67) |  | 3.08 (1.98 to 4.19) |  | 2.10 (1.27 to 2.94) |  | 3.14 (2.13 to 4.16) |  |
| No | 25.68 (24.30 to 27.06) |  | 3.65 (3.25 to 4.05) |  | 2.85 (2.54 to 3.16) |  | 3.91 (3.54 to 4.28) |  |

Data are mean (95% CI). For age, data are unadjusted regression coefficients (95% CI) for a one-year increase.

**Table S5.** Bivariate associations between characteristics of participants and quality-of-life scores.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **QOL Scores** | | | | | | | | | |
|  | **WHOQOL-BREF** | | | | | | | | | |
| **Variable** | **Physical health**  **(0–100)** | ***p* Value** | **Psychological health**  **(0–100)** | ***p* Value** | **Social relationships**  **(0–100)** | ***p V*alue** | **Environment**  **(0–100)** | ***p* Value** | **Overall QOL**  **(0–10)** | ***p* Value** |
| **Age** | 0.10 (−0.05 to 0.24) | 0.182 | 0.14 (0.02 to 0.26) | 0.018 | 0.02 (−0.11 to 0.14) | 0.789 | −0.01 (−0.12 to 0.10) | 0.842 | 0.01 (−0.01 to 0.02) | 0.334 |
| **Gender** |  | 0.974 |  | 0.826 |  | <.001 |  | 0.193 |  | 0.829 |
| Female | 62.20 (60.03 to 64.36) |  | 63.03 (61.27 to 64.80) |  | 69.42 (67.59 to 71.25) |  | 75.23 (73.60 to 76.85) |  | 6.59 (6.33 to 6.85) |  |
| Male | 62.26 (58.83 to 65.70) |  | 63.40 (60.61 to 66.20) |  | 61.55 (58.67 to 64.42) |  | 73.23 (70.67 to 75.80) |  | 6.55 (6.22 to 6.89) |  |
| **Educational level** |  | 0.528 |  | 0.673 |  | 0.445 |  | <0.001 |  | 0.968 |
| Fundamental or secondary | 61.71 (59.09 to 64.32) |  | 62.82 (60.70 to 64.95) |  | 66.84 (64.61 to 69.08) |  | 72.41 (70.49 to 74.34) |  | 6.58 (6.29 to 6.88) |  |
| Higher education | 62.89 (60.28 to 65.50) |  | 63.46 (61.34 to 65.59) |  | 68.05 (65.82 to 70.28) |  | 77.21 (75.29 to 79.14) |  | 6.59 (6.30 to 6.88) |  |
| **Marital status** |  | 0.040*i* |  | 0.332 |  | 0.080 |  | 0.004*ii* |  | 0.226 |
| Single or never married | 61.84 (56.35 to 67.32) |  | 63.59 (59.10 to 68.07) |  | 65.29 (60.59 to 69.99) |  | 75.83 (71.75 to 79.91) |  | 6.56 (6.08 to 7.04) |  |
| Married or living as married | 63.37 (61.24 to 65.51) |  | 63.56 (61.81 to 65.31) |  | 68.35 (66.50 to 70.20) |  | 75.66 (74.07 to 77.26) |  | 6.65 (6.39 to 6.90) |  |
| Divorced, separated, or widowed | 56.88 (52.31 to 61.45) |  | 60.49 (56.75 to 64.23) |  | 63.82 (59.89 to 67.74) |  | 69.36 (65.96 to 72.76) |  | 6.29 (5.88 to 6.71) |  |
| **Household composition** |  | 0.240 |  | 0.377 |  | 0.020 |  | 0.151 |  | 0.303 |
| Living with others | 62.56 (60.51 to 64.60) |  | 63.30 (61.63 to 64.97) |  | 68.02 (66.26 to 69.78) |  | 75.10 (73.56 to 76.63) |  | 6.54 (6.37 to 6.71) |  |
| Living alone | 59.76 (55.55 to 63.97) |  | 61.59 (58.16 to 65.02) |  | 63.33 (59.74 to 66.92) |  | 72.55 (69.40 to 75.70) |  | 6.34 (5.99 to 6.69) |  |
| **Cancer type** |  | 0.075 |  | 0.543 |  | <0.001*iii* |  | 0.033 *iv* |  | 0.021*v* |
| Breast | 62.42 (59.68 to 65.16) |  | 64.20 (61.95 to 66.46) |  | 69.97 (67.65 to 72.29) |  | 76.58 (74.53 to 78.62) |  | 6.64 (6.35 to 6.94) |  |
| Genitourinary | 60.45 (55.89 to 65.00) |  | 60.99 (57.24 to 64.74) |  | 61.19 (57.37 to 65.02) |  | 71.75 (68.36 to 75.15) |  | 6.49 (6.08 to 6.90) |  |
| Gynecological | 64.51 (59.72 to 69.30) |  | 63.82 (59.88 to 67.75) |  | 69.54 (65.52 to 73.55) |  | 74.95 (71.38 to 78.51) |  | 6.53 (6.11 to 6.95) |  |
| Melanoma | 66.03 (61.04 to 71.02) |  | 64.01 (59.91 to 68.11) |  | 65.63 (61.43 to 69.82) |  | 75.43 (71.72 to 79.15) |  | 7.07 (6.63 to 7.51) |  |
| Head and neck | 61.40 (53.96 to 68.83) |  | 61.94 (55.84 to 68.04) |  | 64.73 (58.47 to 71.00) |  | 69.56 (64.04 to 75.08) |  | 6.09 (5.47 to 6.72) |  |
| Soft tissue and bone | 49.85 (41.02 to 58.69) |  | 57.41 (50.15 to 64.68) |  | 56.89 (49.48 to 64.30) |  | 68.16 (61.59 to 74.73) |  | 5.76 (5.04 to 6.49) |  |
| Other | 60.04 (50.19 to 69.90) |  | 62.33 (54.25 to 70.42) |  | 72.59 (64.32 to 80.86) |  | 76.32 (68.99 to 83.65) |  | 6.33 (5.52 to 7.13) |  |
| **Therapy intention** |  | 0.897 |  | 0.347 |  | 0.017 |  | 0.887 |  | 0.243 |
| Palliative | 62.15 (60.08 to 64.22) |  | 63.51 (61.82 to 65.20) |  | 66.21 (64.43 to 68.00) |  | 74.61 (73.05 to 76.17) |  | 6.54 (6.28 to 6.79) |  |
| Curative | 62.45 (58.50 to 66.39) |  | 61.78 (58.57 to 64.99) |  | 70.81 (67.45 to 74.17) |  | 74.85 (71.91 to 77.80) |  | 6.74 (6.38 to 7.11) |  |
| **Estimated life expectancy** |  | 0.001 |  | 0.047 |  | 0.005 |  | 0.015 |  | <0.001 |
| >1 year | 63.82 (61.77 to 65.87) |  | 63.94 (62.25 to 65.64) |  | 68.39 (66.60 to 70.19) |  | 75.57 (74.02 to 77.13) |  | 6.75 (6.50 to 7.01) |  |
| ≤1 year | 56.75 (52.97 to 60.52) |  | 60.39 (57.29 to 63.49) |  | 63.14 (59.89 to 66.39) |  | 71.59 (68.75 to 74.42) |  | 5.98 (5.62 to 6.33) |  |
| **Therapy change** |  | 0.035 |  | 0.164 |  | 0.097 |  | 0.136 |  | 0.090 |
| Yes | 67.57 (62.26 to 72.88) |  | 66.03 (61.69 to 70.36) |  | 70.82 (66.25 to 75.38) |  | 77.50 (73.52 to 81.48) |  | 6.92 (6.46 to 7.39) |  |
| No | 61.51 (59.57 to 63.45) |  | 62.76 (61.17 to 64.35) |  | 66.72 (65.02 to 68.42) |  | 74.29 (72.82 to 75.76) |  | 6.54 (6.29 to 6.79) |  |

Data are mean (95% confidence interval [CI]). For age, data are unadjusted regression coefficients (95% CI) for a one-year increase. Bonferroni-corrected post-hoc thresholds were applied after obtaining significant results: *i* significant differences in pairwise comparisons (threshold *p* < 0.01667): married or living as married vs. divorced, separated, or widowed (estimated difference [ED], 6.49 [1.37 to 11.62]; *P* = 0.011); *ii* significant differences in pairwise comparisons (threshold *p* < 0.01667): single or never married vs. divorced, separated, or widowed (ED, 6.47 [1.08 to 11.87]; *p* = 0.01659); and married or living as married vs. divorced, separated, or widowed (ED, 6.30 [2.50 to 10.10]; *p* = 0.001); *iii* significant differences in pairwise comparisons (threshold *p* < 0.0024): breast vs. genitourinary (ED, 8.78 [4.25 to 13.30]; *p* < 0.001); and breast vs. soft tissue and bone (ED, 13.08 [5.19 to 20.97]; *p* < 0.001); *iv* significant differences in pairwise comparisons (threshold *p* < 0.0024): none; *v* significant differences in pairwise comparisons (threshold *p* < 0.0024): melanoma vs. soft tissue and bone (ED, 1.31 [0.49 to 2.12]; *p* = 0.001). QOL—quality of life.