**Chapter 9**

**Supplemental Data 2: Tables 1 to 4**

Table 1: Study characteristics.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Study period** | **Center (city, country)** | **Study design** | **Etiology of Cushing’s syndrome (N)** | **Treatment** | **Age, mean (range) in years** | **Sex, female/male** | **Duration of follow-up,  mean (range)  in months** | **Type of controls (N)** |
| Abraham 2013 | 1999-2012 | Bethesda, USA | Cross-sectional | Pituitary (53), ectopic (13) | - | 41.6 (18-73) | 52/14 | - | - |
| Alcalar 2013 | 1996-2008 | Istanbul, Turkey | Cross-sectional | Pituitary (40) | Transsphenoidal surgery, part also bilateral adrenalectomy and/or gamma knife radiosurgery | 39.6 (SD 10.6) | 31/9 | - | Healthy, matched demographically (40) |
| Andela 2013+ | Not reported | Leiden, the Netherlands | Cross-sectional | Pituitary (25) | Transsphenoidal surgery, part also had bilateral adrenalectomy or radiotherapy | 45 (SD 8) | 21/4 | - | Healthy, matched for age, sex, education (25) |
| Crespo 2014 | Not reported | Barcelona, Spain | Cross-sectional | Pituitary (28), adrenal (6), ectopic (1) | Neuro- or adrenal surgery, radiotherapy, and/or medical treatment | Cured: 44.5 (SD 10); medically treated: 41.3 (SD 12.3) | 30/5 | - | Healthy, matched for age, sex, years of education (35) |
| Dorn 1997+ | Not reported | Bethesda, USA | Cohort | Pituitary (29), adrenal (1), ectopic (3) | Transsphenoidal surgery, bilateral adrenalectomy, radiotherapy, or thoracotomy (resection of ectopic tumor) | 36.4 (19-50) | 28/5 | 12 | - |
| Dorn 2000+ | Not reported | Bethesda, USA | Cohort | Pituitary (29), adrenal (1), ectopic (3) | Transsphenoidal surgery, bilateral adrenalectomy, radiotherapy, or thoracotomy (resection of ectopic tumor) | 36.4 (19-50) | 28/5 | 12 | Healthy, matched for age, sex, socioeconomic status (17) |
| Fleseriu 2012 | 2008-2011 | 17 centers, USA | Trial | Pituitary (43), adrenal (3), ectopic (4) | Mifepristone, part also had transsphenoidal surgery and/or radiotherapy | 45.4 (26-71) | 35/15 | Maximum 6 | - |
| Flitsch 2000 | Not reported | Hamburg, Germany | Cohort | Pituitary (19) | Transsphenoidal surgery | 33.6 (SD 12.3) | 12/7 | (6-8) | - |
| Forget 2016 | 1997-2001 | Montréal, Canada | Cohort | Pituitary (9), adrenal (9) | Pituitary or adrenal surgery | 39.6 (SD 9.8) | 15/3 | 36 | Healthy, matched for age, sex, education, type of occupation (18) |
| Giebels 2014 | Not reported | Nijmegen, the Netherlands | Cross-sectional | Pituitary (31) | Bilateral adrenalectomy, pituitary surgery and/or radiotherapy | 55.3 (SD 12.1) | 25/6 | - | - |
| Hawn 2002 | 1994-2000 | Portland, USA | Cohort | Pituitary (15), adrenal (3) | Bilateral adrenalectomy, part also pituitary surgery and/or gamma knife radiosurgery | 47 (18-72) | 16/2 | Median 29 | Normative data from general population (2474) |
| Heald 2004+ | 1988-2003 | Salford, UK | Cross-sectional | Pituitary (15) | Pituitary surgery, part also radiotherapy | 48.7 (95% confidence interval 43.0-54.5) | 10/5 | - | Normative data |
| Heald 2006+ | Not reported | Salford, UK | Cross-sectional | Pituitary (16) | Transsphenoidal surgery, bilateral adrenalectomy, and/or radiotherapy | 53.3 (47-59.5) | 13/3 | - | Normative data |
| Hook 2007+ | Not reported | Ann Arbor, USA | Cohort | Pituitary (27) | Transsphenoidal surgery | 38.74 (18-72) | 23/4 | (13-18) | - |
| Huan 2014 | 2006-2011 | Ji’nan, China | Cohort | Pituitary (87) | Transsphenoidal surgery | 43.3 (23-65) | 64/23 | 45 (13-121) | - |
| Iacobone 2012 | 2000-2009 | Padua, Italy | Cohort | Adrenal (20) | Adrenalectomy | Median 57 (36-78) | 8/12 | 54 (SD 34) | - |
| Johnson 2003 | 2001-2002 | Charlottesville, USA | Cross-sectional | Pituitary (42) | - | 40 (SD 14) | 33/9 | - | General population |
| León-Carrión 2009 | Not reported | Seville, Spain | Cross-sectional | Pituitary (14), adrenal (1) | - | 38.5 (18-59) | 15/0 | - | Healthy, matched for age, sex, education (15) |
| Lindsay 2006 | 1999-2004 | Bethesda, USA | Part 1: cohort; part 2: cross-sectional | Part 1: pituitary (23); part 2: pituitary (305), adrenal (17), ectopic (21) | Transsphenoidal surgery, uni- or bilateral adrenalectomy, and/or radiotherapy | Part 1: 39.5 (22-65); part 2: 48.2 (13-81) | Part 1: 19/4; part 2: 264/79 | Part 1: Minimum 6 | - |
| Mauri 1993 | 1989-1991 | Milan, Italy | Cohort | Pituitary (25) | Transsphenoidal surgery | 35.7 (16-58) | 17/8 | 6 | Healthy, matched for age, sex, education (25) |
| Milian 2013+ | Not reported | Tuebingen, Germany | Cohort | Pituitary (14) | Transsphenoidal surgery | Not reported | Not reported | 12 | - |
| Milian 2013 (2)+ | 2009-2012 | Tuebingen, Germany | Cohort | Pituitary (17) | Transsphenoidal surgery | 41.7 (19-70) | 14/3 | 14.4 (3-40) | - |
| Milian 2014+ | 1998-2013 | Tuebingen and Freiburg, Germany | Cohort | Pituitary (72) | Transsphenoidal surgery, part also radiotherapy | 45.9 (22-76) | 61/11 | 42.1 (3-132) | - |
| Milian 2015+ | 1983-2013 | Tuebingen, Erlangen, and Essen, Germany | Cross-sectional | Pituitary (176) | Transsphenoidal surgery | 46.1 (18-88) | 144/32 | - | - |
| Nelson 2013+ | 2006-2009 | Multiple international centers | Randomized controlled trial | Pituitary (162) | Pasireotide | 40.2 (18-71) | 126/36 | 12 | - |
| Papakokkinou 2015+ | Not reported | Gothenburg, Sweden | Cross-sectional | Pituitary (39), adrenal (12) | Transsphenoidal surgery, uni- or bilateral adrenalectomy, and/or radiotherapy | 52.5 (SD 14.6) | 47/4 | - | Healthy, matched for age, sex (51) |
| Papoian 2016 | 2014 | USA | Cross-sectional | Pituitary (184), adrenal (67), ectopic (12) | Transsphenoidal surgery, uni- or bilateral adrenalectomy, radiotherapy, and/or medication | 48 (16-76) | 240/27 | - | - |
| Pivonello 2014+ | 2006-2009 | Multiple international centers | Randomized controlled trial | Pituitary (162) | Pasireotide | 40.2 (18-71) | 126/36 | 12 | - |
| Psaras 2011+ | 1998-2007 | Tuebingen, Germany | Cross-sectional | Pituitary (24) | Transsphenoidal surgery, part also radiotherapy | 52.6 (SD 15.7) | 17/7 | 2.8 (1.0-9.0) | Healthy, matched for age, sex, education (28) |
| Ragnarsson 2014+ | Not reported | Gothenburg, Sweden | Cross-sectional | Pituitary (42), adrenal (11) | Not reported | 53 (SD 14) | 47/6 | - | Healthy, matched for age, sex, education (53) |
| Ritvonen 2015 | 2000-2010 | Helsinki, Finland | Cross-sectional | Pituitary (21) | Transsphenoidal surgery, part also adrenalectomy | 52.3 (SD 12.8) | 18/3 | - | Age and sex standardized sample from general population (4040) |
| Roset 2013 | 2006 | Spain, France, Germany, the Netherlands, Italy | Cross-sectional | Pituitary (107), adrenal (18) | Pituitary or adrenal surgery | 45.3 (SD 13.1) | 104/21 | - | - |
| Santos 2012+ | 2007-2011 | Sant Pau, Spain | Cohort | Pituitary (47), adrenal (11), ectopic (1) | Transsphenoidal or adrenal surgery, radiotherapy, and/or medication | 48.3 (SD 12.4) | 50/9 | Cured: 9 (SD 3); active: 3 (SD 1.5); improvement: 9 (SD 3) | - |
| Santos 2015+ | Not reported | Sant Pau, Spain | Cross-sectional | Pituitary (30), adrenal (7), ectopic (1) | Transsphenoidal surgery, adrenalectomy, radiotherapy, and/or medication | Active: 44.3 (SD 9.3); remission: 42.9 (SD 10.6) | 32/6 | - | Healthy, matched for age, sex, years of education (38) |
| Sonino 2006+ | Not reported | Padua, Italy | Cross-sectional | Pituitary (20), adrenal (4) | Transsphenoidal surgery, adrenalectomy, radiotherapy, and/or medication | 34.5 (14-57) | 19/5 | - | Healthy, matched for age, sex, marital status, social class (24) |
| Sonino 2007+ | Not reported | Padua, Italy | Cross-sectional | Pituitary (15) | Transsphenoidal surgery, part also radiotherapy | Not reported | Not reported | - | Healthy, matched for age, sex, marital status (15) |
| Starkman 1992 | Not reported | Ann Arbor, USA | Cross-sectional | Pituitary (9), adrenal (2), intermittent hypercortisolemia and partial cortisol receptor insensitivity (1) | - | 37.3 (16-72) | 10/2 | - | Normative data from the general population |
| Starkman 2003+ | Not reported | Ann Arbor, USA | Cohort | Pituitary (24) | Transsphenoidal surgery | 33.7 (SD 13.1) | 20/4 | 15.7 (SD 8.8) | - |
| Starkman 2007+ | Not reported | Ann Arbor, USA | Cohort | Pituitary (23) | Transsphenoidal surgery | 34.0 (SD 13.3) | 19/4 | 15.9 (SD 9.0) | - |
| Szczesniak 2017 | 2012-2015 | Wroclaw, Poland | Cross-sectional | Pituitary (15) | Not reported | 45.1 (SD 13.92) | 14/1 | - | Healthy (65) |
| Tiemensma 2010+ | Not reported | Leiden, the Netherlands | Cross-sectional | Pituitary (51) | Transsphenoidal surgery, part also radiotherapy | 53 (SD 13) | 43/8 | - | Healthy, matched for age, sex, education (51) |
| Tiemensma 2010 (2)+ | Not reported | Leiden, the Netherlands | Cross-sectional | Pituitary (74) | Transsphenoidal surgery, part also radiotherapy | 52 (SD 13) | 61/13 | - | Healthy, matched for age, sex, education (74) |
| Tiemensma 2011+ | Not reported | Leiden, the Netherlands | Cross-sectional | Pituitary (46), adrenal (6) | Transsphenoidal surgery or adrenalectomy, part also radiotherapy | 54 (SD 11) | 45/7 | - | - |
| Van Aken 2005+ | 1978-2002 | Leiden, the Netherlands | Cross-sectional | Pituitary (58) | Transsphenoidal surgery, part also radiotherapy or bilateral adrenalectomy | 51.7 (31-84) | 48/10 | - | Age-adjusted reference values from literature |
| Van der Pas 2012 | Not reported | Four medical centers in the Netherlands | Cross-sectional | Pituitary (17) | Medication (pasireotide, cabergoline, ketoconazole) | 45.5 (22-67) | 13/4 | - | Age-adjusted literature reference values |
| Voigt 1985 | Not reported | Berlin, Munich, and Ulm, Germany | Cross-sectional | Pituitary (17) | Transsphenoidal surgery and/or bilateral adrenalectomy | 42 (16-63) | 14/3 | - | Healthy (1761) |
| Ye 2017 | 2005-2015 | Vancouver, Canada | Cohort | Pituitary (43) | Transsphenoidal surgery | 42.4 | Not reported | 7.4 | General population |

N=number, SD=standard deviation, +contain (partially) the same population as other included article(s)  
Milian 2013 (2) = Neuroendocrinology 2013;98:188–199. Tiemensma 2010 (2) = J Clin Endocrinol Metab 2010;95:2699–2714.

Table 2: Risk of bias assessment.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Loss to follow-up,  N (%) *Missing data, N (%)#*** | **Inclusion of patients** | **Criteria for diagnosis of Cushing’s syndrome** | **Criteria for remission of Cushing’s disease** | **Test quality  (cognitive domains; validation; test instructions reported)^** |
| Abraham 2013 | *3 (4%)* | Consecutive | Urinary free cortisol and midnight cortisol | - | Cognition not tested; partially validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Alcalar 2013 | *0 (0%)* | Consecutive | Midnight cortisol, 1 and 8 mg dexamethasone test, urinary free cortisol, MRI, and CRH test | Cortisol <1.8 µg/dl after low dose dexamethasone test and normal urinary free cortisol | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Andela 2013 | *0 (0%)* | Only patients with long term remission | Urinary free cortisol, 1 mg dexamethasone test, and midnight salivary cortisol | 1 mg dexamethasone test, urinary free cortisol, and CRH test or insulin tolerance test | Multiple cognitive domain assessed; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Crespo 2014 | *0 (0%)* | Only eucortisolemic patients | Not reported | Adrenal insufficiency or morning cortisol suppression after 1 mg dexamethasone and normal urinary free cortisol | Multiple cognitive domains assessed; only validated tests; test instructions reported |
| Dorn 1997 | 4 (12%) | Unclear | Loss of cortisol diurnal rhythm, urinary free cortisol, 17-hydroxycorticosteroids, IPSS, and CT/MRI; diagnosis was confirmed by surgery and response to therapy | Morning plasma cortisol <3 µg/dl, CRH test | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Dorn 2000 | 4 (12%) | Unclear | Loss of cortisol diurnal rhythm, urinary free cortisol, 17-hydroxycorticosteroids, IPSS, and CT/MRI; diagnosis was confirmed by surgery and response to therapy | Morning plasma cortisol <3 µg/dl, CRH test | 1 cognitive domain assessed; only validated tests; test instructions not reported |
| Fleseriu 2012 | 7 (14%) | Only patients with diabetes mellitus, impaired glucose tolerance and/or hypertension | Urinary free cortisol, midnight salivary cortisol, dexamethasone suppression test | Not reported | 1 cognitive domain assessed; only validated measures; test instructions not reported |
| Flitsch 2000 | 1 (5%) | Only patients with full total tumor removal | Not reported | Not reported | Cognition not tested; partially validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Forget 2016 | 0 (0%) | Only patients in remission | Clinical criteria, cortisol rhythm, urinary free cortisol, dexamethasone test, ACTH, MRI/CT, IPSS | Not reported | Multiple cognitive domains assessed; only validated tests; test instructions reported |
| Giebels 2014 | *0 (0%)* | Only patients with adrenal insufficiency after treatment | Not reported | Not reported | 1 cognitive domain assessed; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Hawn 2002 | 4 (22%) | Consecutive | Not reported | Not reported | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Heald 2004 | *0 (0%)* | Only patients after successful surgery | Clinical criteria, biochemical evidence of cortisol excess and ACTH immunostaining histology | Normal urinary free cortisol | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Heald 2006 | *0 (0%)* | Only patients after successful surgery | Clinical criteria, circadian rhythm, urinary free cortisol, low dose (2 mg/d) dexamethasone test, ACTH immunostaining histology | Not reported | Multiple cognitive domains assessed; only validated tests; test instructions not reported |
| Hook 2007 | 13 (48%) | Only patients after successful surgery | High cortisol and ACTH, loss of cortisol circadian rhythm, CRH test | Normalization of cortisol | Multiple cognitive domains assessed; only validated tests; test instructions reported |
| Huan 2014 | Not reported | Consecutive | Clinical criteria, serum cortisol, cortisol diurnal rhythm, urinary free cortisol, ACTH, 2 mg dexamethasone test, 16 mg dexamethasone test, CRH test, adenoma with positive immunochemistry, MRI | Normalization of cortisol | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Iacobone 2012 | Not reported | Consecutive | Absent clinical features, laboratory abnormalities suggesting ACTH-independent hypercortisolemia (1 mg dexamethasone test, ACTH, urinary free cortisol) | Not reported | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Johnson 2003 | *0 (0%)* | Consecutive | Not reported | - | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| León-Carrión 2009 | *0 (0%)* | Unclear | Clinical criteria, urinary free cortisol, nighttime serum cortisol | - | Multiple cognitive domains assessed; partially validated tests; test instructions reported |
| Lindsay 2006 | 10 (30%) | Minimum follow-up of six months; part 2: only patients in remission | Not reported | Not reported | Cognitive function assessed but not specified; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Mauri 1993 | 17 (68%) | Selected patients, unclear selection criteria | “usual criteria” (clinical, hormonal, neuroradiological) | Not reported | Multiple cognitive domains assessed; only validated tests; test instructions not reported |
| Milian 2013 | 6 (43%) | Unclear | Preoperative endocrinological tests, neuro-imaging, histopathology, immunostaining | Not reported | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Milian 2013 (2) | 0 (0%) | Unclear | Preoperative endocrinological tests, histopathology, immunostaining | Urinary free cortisol, morning serum cortisol, 2 mg dexamethasone suppression test | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Milian 2014 | Not reported | Only biochemically cured patients | Not reported | Urinary free cortisol, morning serum cortisol, 2 mg dexamethasone suppression test | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Milian 2015 | *44 (25%); partial missing data (no CushingQoL)* | Consecutive | Not reported | Not reported | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Nelson 2013 | 0 (0%) | Unclear | Urinary free cortisol, ACTH, MRI, IPSS | Urinary free cortisol | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Papakokkinou 2015 | *0 (0%)* | Only patients in remission | Not reported | Urinary free cortisol, 1 mg dexamethasone test, clinical criteria | 1 cognitive domain assessed; only validated measures; test instructions reported |
| Papoian 2016 | *26 (9%)* | All eligible patients were approached | Self-reported diagnosis and member of CSRF (Cushing's support and research foundation) | Not reported | Cognition not tested; only validated measures; test instructions not applicable, questionnaire assessment only |
| Pivonello 2014 | 0 (0%) | Unclear | Urinary free cortisol, ACTH, MRI, IPSS | Urinary free cortisol | Cognition not tested; only validated measures; test instructions not applicable, questionnaire assessment only |
| Psaras 2011 | *9 (27%)* | Unclear | Pre-operative endocrinological tests, histopathology, immunostaining | Urinary free cortisol, morning serum cortisol, 2 mg dexamethasone test | Multiple cognitive domains assessed; only validated measures; test instructions reported |
| Ragnarsson 2014 | *0 (0%)* | Consecutive | Not reported in detail: clinical, biochemical, radiological and histopathological data | 1 mg dexamethasone test, urinary free cortisol | Multiple cognitive domains assessed; only validated measures; test instructions not reported |
| Ritvonen 2015 | *0 (0%)* | Consecutive | Not reported | 1 mg dexamethasone test, urinary free cortisol, ACTH | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Roset 2013 | *9 (7%); partial missing data (no SF-36 or CushingQoL)* | Only patients after successful surgery | Not reported in detail, histological confirmation | Not reported | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Santos 2012 | Not reported | Unclear | Not reported | Adrenal insufficiency or morning cortisol suppression after 1 mg dexamethasone and normal urinary free cortisol | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Santos 2015 | *0 (0%)* | Only right-handed patients | Not reported | Adrenal insufficiency or morning cortisol suppression after 1 mg dexamethasone and normal urinary free cortisol | Multiple cognitive domains assessed; only validated tests; test instructions reported |
| Sonino 2006 | *0 (0%)* | Only patients in remission for 1-3 years | Clinical criteria, urinary free cortisol, circadian rhythm, low and high dose dexamethasone test, CRH test, ACTH, CT/MRI, IPSS | Normalization of cortisol | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Sonino 2007 | *0 (0%)* | Only patients in remission for 9 months to 3 years | Standard criteria including clinical features, baseline hormone measurements, dynamic tests and morphological assessment | Regression of clinical and biochemical characteristics of endogenous hypercortisolism, urinary free cortisol, low dose dexamethasone test | Cognition not tested; partially validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Starkman 1992 | *1 (8%)* | Consecutive | Clinical criteria, circadian rhythm, urinary free cortisol, plasma cortisol | - | Multiple cognitive domains assessed; only validated tests; test instructions not reported |
| Starkman 2003 | Not reported | Consecutive | Clinical criteria, cortisol, urinary free cortisol, ACTH, circadian rhythm, 2 mg dexamethasone test, 8 mg dexamethasone test, IPSS, MRI | Not reported | Multiple cognitive domains assessed; only validated tests; test instructions reported |
| Starkman 2007 | Not reported | Consecutive | Clinical criteria, cortisol, urinary free cortisol, ACTH, circadian rhythm, 2 mg dexamethasone test, 8 mg dexamethasone test, IPSS, MRI | Not reported | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Szczesniak 2017 | *0 (0%)* | Unclear | Clinical criteria, urinary free cortisol, circadian rhythm, 1 mg dexamethasone test, serum cortisol, high dose dexamethasone test, ACTH, MRI | Serum cortisol, circadian rhythm, 1 mg dexamethasone test | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Tiemensma 2010 | *0 (0%)* | Minimum of 1 year remission | Clinical criteria, urinary free cortisol, dexamethasone 1 mg test, since 2004 also midnight salivary cortisol, ACTH | Urinary free cortisol, dexamethasone 1 mg test | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Tiemensma 2010 (2) | *11 (13%)* | Only patients in remission | Clinical criteria, urinary free cortisol, dexamethasone 1 mg test, since 2004 also midnight salivary cortisol, ACTH | Urinary free cortisol, dexamethasone 1 mg test | Multiple cognitive domains assessed; only validated tests; test instructions partially reported |
| Tiemensma 2011 | *3 (6%)* | Minimum of 1 year remission | Clinical criteria, urinary free cortisol, dexamethasone 1 mg test, since 2004 also midnight salivary cortisol, ACTH | Urinary free cortisol, dexamethasone 1 mg test | Cognition not tested; partially validated tests; test instructions not applicable, questionnaire assessment only |
| Van Aken 2005 | *0 (0%)* | Only cured patients | Not reported | Urinary free cortisol, dexamethasone 1 mg test | Cognition not tested; only validated tests; test instructions not applicable, questionnaire assessment only |
| Van der Pas 2012 | *1 (6%)* | Unclear | Not reported | Urinary free cortisol | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Voigt 1985 | *0 (0%)* | Unclear | Standard procedures including resistance to >6 mg dexamethasone/day, vasopressin test, ACTH | Not reported | Cognition not tested; partially validated questionnaires; test instructions not applicable, questionnaire assessment only |
| Ye 2017 | 32 (74%) | Consecutive | Not reported | Not reported | Cognition not tested; only validated questionnaires; test instructions not applicable, questionnaire assessment only |

ACTH=adrenocorticotropic hormone, CRH=corticotropin-releasing hormone, CT=computed tomography, IPSS=inferior petrosal sinus sampling, MRI=magnetic resonance imaging, N=number  
Milian 2013 (2) = Neuroendocrinology 2013;98:188–199. Tiemensma 2010 (2) = J Clin Endocrinol Metab 2010;95:2699–2714.  
#Loss to follow-up for longitudinal studies, missing data regarding quality of life and/or cognitive functioning for cross-sectional studies.  
^Sequence of cognitive tests was not reported by any study and therefore not reported in this table.Table 3: Study outcomes quality of life and cognitive performance.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Scales** | **Type of scale** | **Score before treatment** | **Score after treatment** | **Score healthy controls** |
| *Quality of life* |  |  |  |  |  |
| Abraham 2013 | SF-36 | Generic | PCS: 34.6 (SEM 1.4);  MCS: 40.9 (SEM 1.6) | - | - |
| Alcalar 2013 | SF-36  BDI  MBSRQ | Generic  Domain-specific: depression  Domain-specific: other | - | Total: **SF-36:** PF 21.22 (SD 5.49), RP 6.28 (SD 1.95), BP 7.92 (SD 3.06), GH 15.98 (SD 5.45), SF 7.60 (SD 2.45), RE 4.92 (SD 1.24), MH 20.08 (SD 6.10), VT 14.93 (SD 5.64); **BDI:** 14.02 (SD 12.51); **MBSRQ:** appearance evaluation 3.23 (SD 0.89), appearance orientation 3.50 (SD 0.88), fitness evaluation 3.35 (SD 0.86), fitness orientation 3.10 (SD 0.68), health evaluation 3.17 (SD 0.84), health orientation 3.65 (SD 0.75), body areas satisfaction 3.16 (SD 1.09), mean item score 3.33 (SD 0.63); Remission: **SF-36:** PF 21.88 (SD 5.35), RP 6.44 (SD 1.93), BP 8.19 (SD 2.92), GH 17.01 (SD 5.37), SF 7.75 (SD 2.52), RE 5.10 (SD 1.19), MH 20.09 (SD 6.24), VT 15.25 (SD 5.78); **BDI:** 12.81 (SD 12.75); **MBSRQ:** appearance evaluation 3.28 (SD 0.96), appearance orientation 3.58 (SD 0.94), fitness evaluation 3.49 (SD 0.88), fitness orientation 3.18 (SD 0.68), health evaluation 3.19 (SD 0.78), health orientation 3.67 (SD 0.74), body areas satisfaction 3.31 (SD 1.09), mean item score 3.40 (SD 0.66); No remission: **SF-36:** PF 18.63 (SD 5.61), RP 5.63 (SD 1.99), BP 6.81 (SD 3.52), GH 11.88 (SD 3.68), SF 7.00 (SD 2.14), RE 4.25 (SD 1.28), MH 20.00 (SD 5.90), VT 13.63 (SD 5.15); **BDI:** 18.88 (SD 10.86); **MBSRQ:** appearance evaluation 2.99 (SD 0.49), appearance orientation 3.19 (SD 0.54), fitness evaluation 2.79 (SD 0.46), fitness orientation 2.77 (SD 0.61), health evaluation 3.06 (SD 1.08), health orientation 3.59 (SD 0.83), body areas satisfaction 2.56 (SD 0.86), mean item score 3.02 (SD 0.33) | **SF-36:** PF 24.67 (SD 3.03), RP 6.98 (SD 1.58), BP 11.03 (SD 9.75), GH 19.03 (SD 3.08), SF 8.24 (SD 2.33), RE 5.16 (SD 1.31), MH 21.22 (SD 4.45), VT 16.08 (SD 4.26); **BDI:** 9.41 (SD 7.86); **MBSRQ:** appearance evaluation 3.59 (SD 0.82), appearance orientation 3.70 (SD 0.72), fitness evaluation 3.79 (SD 0.69), fitness orientation 3.16 (SD 0.57), health evaluation 3.69 (SD 0.69), health orientation 3.52 (SD 0.67), body areas satisfaction 3.79 (SD 0.66), mean item score 3.60 (SD 0.49) |
| Andela 2013 | BAI, FQ  MADRS, IDS | Domain-specific: anxiety  Domain-specific: depression | - | **BAI:** 28.4 (SD 5.7); **FQ:** 24.5 (SD 17.4); **MADRS:** 6.3 (SD 5.5); **IDS:** 46.8 (SD 13.0) | **BAI:** 24.0 (SD 3.1); **FQ:** 14.2 (SD 10.0); **MADRS:** 1.4 (SD 1.8); **IDS:** 36.3 (SD 5.8) |
| Dorn 1997 | SCL-90-R  STAI  HRSD  POMS | Generic  Domain-specific: anxiety  Domain-specific: depression  Domain-specific: other | **SCL-90-R:** somatization 63.86 (SD 7.12), obsessive-compulsive 65.29 (SD 9.73), interpersonal sensitivity 64.00 (SD 9.11), depression 66.33 (SD 7.84), anxiety 65.00 (SD 10.25), hostility 58.71 (SD 8.70), phobia 56.43 (SD 9.48), paranoid 56.00 (SD 11.02), psychotic 67.86 (SD 5.76), general severity 66.52 (SD 7.71), positive symptom distress 63.14 (SD 7.74), positive symptom total 64.38 (SD 7.93); **STAI:** state 60.09 (SD 13.02), trait 63.09 (SD 14.41); **HRSD:** 7.32 (SD 5.58); **POMS:** tension/anxiety 13.94 (SD 8.74), depression/dejection 13.24 (SD 10.08), anger/hostility 8.18 (SD 9.12), vigor 10.18 (SD 7.74), fatigue/inertia 11.53 (SD 8.65), confusion/bewilderment 9.82 (SD 4.92), total mood disorder 46.53 (SD 37.79) | **SCL-90-R:** somatization 59.05 (SD 9.11), obsessive-compulsive 56.00 (SD 13.68), interpersonal sensitivity 54.05 (SD 12.90), depression 55.48 (SD 13.77), anxiety 53.67 (SD 12.78), hostility 51.57 (SD 10.15), phobia 51.14 (SD 7.58), paranoid 50.00 (SD 11.08), psychotic 53.95 (SD 9.67), general severity 55.24 (SD 12.48), positive symptom distress 57.05 (SD 7.85), positive symptom total 54.19 (SD 12.79); **STAI:** state 52.26 (SD 13.73), trait 55.50 (SD 11.89); **HRSD:** 5.05 (SD 7.32); **POMS:** tension/anxiety 9.41 (SD 9.52), depression/dejection 7.82 (SD 9.19), anger/hostility 6.00 (SD 9.73), vigor 13.77 (SD 7.81), fatigue/inertia 7.88 (SD 7.85), confusion/bewilderment 6.59 (SD 6.43), total mood disorder 23.94 (SD 43.96) | - |
| Fleseriu 2012 | SF-36  BDI-II | Generic  Domain-specific: depression | **SF-36:** MCS 40.0 (SD 14.5), PCS 34.9 (SD 11.0); **BDI:** median 14.5 (range 0-49) | **SF-36:** MCS 45.4 (SD 12.5), PCS 39.1 (SD 10.8); **BDI:** median 9.5 (range 0-36) | - |
| Flitsch 2000 | STAI | Domain-specific: anxiety | **STAI:** state 44.4 (SD 15.01) | **STAI:** state 40.6 (SD 15.47) | - |
| Giebels 2014 | SCL-90, SIP  CIS, AFQ | Generic  Domain-specific: fatigue | - | Non-severely fatigued: **SCL-90:** anxiety 12.1 (± 4.1), agoraphobia 9.1 (± 4.1), depression 22.5 (± 10.2), somatization 17.4 (± 5.6), obsessive-compulsive behavior 12.9 (± 5.2), interpersonal sensitivity 26.1 (± 15.4), hostility 7.4 (± 3.1), sleep 4.1 (± 1.4); **SIP:** home management 33.2 (± 41.5), work 72.1 (± 137.0), recreation and pastimes 22.3 (± 40.6), sleep/rest 18.0 (± 40.2), alertness 40.1 (± 92.4), social interaction 44.4 (± 74.0); Severely fatigued: **SCL-90:** anxiety 16.9 (± 4.4), agoraphobia 10.2 (± 4.7), depression 26.0 (± 5.8), somatization 24.3 (± 6.6), obsessive-compulsive behavior 18.5 (± 6.1), interpersonal sensitivity 24.5 (± 6.7), hostility 7.2 (± 1.2), sleep 6.6 (± 3.2); **SIP:** home management 95.0 (± 66.3), work 120.9 (± 167.6), recreation and pastimes 86.9 (± 60.6), sleep/rest 49.1 (± 46.4), alertness 94.0 (± 98.7), social interaction 48.9 (± 70.3); Total group: fatigue used to categorize patients; **CIS:** 28.5 (± 12.7). | - |
| Hawn 2002 | SF-36 | Generic | - | PF 65 (SD 26), RP 39 (SD 44), BP 52 (SD 26), GH 44 (SD 25), SF 53 (SD 31), RE 43 (SD 45), MH 58 (SD 21) , VT 30 (SD 24) | PF 85 (SD 23), RP 81 (SD 34), BP 78 (SD 24), GH 72 (SD 20), SF 83 (SD 23), RE 81 (SD 33), MH 75 (SD 18) , VT 61 (SD 21) |
| Heald 2004 | GHQ-28, WHOQOL-BREF  HADS-UK  FACT, SAS 1-2 | Generic  Domain-specific: anxiety and depression  Domain-specific: other | - | **GHQ-28:** 40 (SEM 4); **WHOQOL-BREF:** physical 35 (SEM 5), psychological 42 (SEM 6), environment 53 (SEM 5); **HADS-UK:** depression 10 (SEM 1), anxiety 10 (SEM 1), *total score 20 (SD 1.4)*; **FACT-G:** 64 (SEM 3); **FACT-F:** 17 (SEM 1); **SAS1:** 2.6 (SEM 0.1); **SAS2:** 2.5 (SEM 0.2) | **GHQ-28:** 16.1 (SD 3.8); **WHOQOL-BREF:** physical 70.2 (SD 5.1), psychological 69.8 (SD 4.8), environment 77.2 (SD 5.3); **HADS-UK:** depression 3.7 (SD 3.1), anxiety 6.1 (SD 3.8), *total score 9.8 (SD 4.9)*; **FACT-G:** 85.0 (SD 14.8); **FACT-F:** 36.8 (SD 10.5); **SAS1:** 1.9 (SD 0.3); **SAS2:** 1.9 (SD 0.39) |
| Huan 2014 | CushingQoL | Disease-specific | - | Men: 55.98 (SD 17.88); Women: 57.00 (SD 15.32) | - |
| Iacobone 2012 | SF-36 | Generic | MCS: 43.8 (SD 11.8),  PCS: 50.9 (SD 7.3) | MCS: 54.1 (SD 10.1),  PCS: 56.7 (SD 7.3) | - |
| Johnson 2003 | SF-36 | Generic | PF 36.6 (± 12.1), RP 36.1 (± 13.4), BP 40.8 (± 11.6), GH 36.4 (± 10.7), SF 35.0 (± 12.9), RE 38.8 (± 14.2), MH 38.4 (± 11.0), VT 35.4 (± 11.8), PCS 37.5 (± 12.5), MCS 37.9 (± 12.0) | - | Normal population mean: 50, SD: 10 |
| Lindsay 2006 | SF-36 | Generic | PF 28.3 (SD 11.0), RP 31.8 (SD 10.4), BP 41.9 (SD 11.4), GH 34.4 (SD 8.4), SF 29.8 (SD 14.7), RE 36.6 (SD 13.1), MH 39.7 (SD 11.1), VT 36.4 (SD 12.4), PCS 32.6 (SD 10.5), MCS 38.8 (SD 12.5) | Part 1: PF 45.9 (SD 11.5), RP 45.9 (SD 12.9), BP 48.6 (SD 9.4), GH 48.1 (SD 9.9), SF 46.7 (SD 11.4), RE 49.0 (SD 8.1), MH 51.4 (SD 9.5), VT 48.3 (SD 9.5), PCS 45.8 (SD 12.7), MCS 50.5 (SD 9.6); part 2: PF 45.5 (SD 11.5), RF 45.7 (SD 12.1), BP 47.4 (SD 11.9), GH 44.2 (SD 12.7), SF 47.2 (SD 11.7), RE 45.6 (SD 12.5), MH 47.3 (SD 11.4), VT 46.5 (SD 12.6), PCS 45.7 (SD 12.1), MCS 47.0 (SD 11.9) | - |
| Milian 2013 | SF-36, SCL-90-R | Generic | **SF-36:** PF 9.6 (SD 20), RP 21.6 (SD 32), BP 24.9 (SD 28), GH 12.1 (SD 17), SF 12.4 (SD 26), RE 22.1 (SD 30), MH 13.0 (SD 23), VT 9.8 (SD 21); **SCL-90-R:** somatization 80.9 (SD 23), obsessive-compulsive 82.4 (SD 22), interpersonal sensitivity 79.1 (SD 23), depression 87.1 (SD 22), anxiety 83.1 (SD 20), hostility 77.6 (SD 15), phobic anxiety 72.0 (SD 30), paranoid ideation 65.1 (SD 31), psychoticism 80.4 (SD 23), global severity index 84.1 (SD 23), positive symptom distress index 84.6 (SD 23), positive symptom total 69.4 (SD 23) | **SF-36:** PF 41.9 (SD 33), RP 39.5 (SD 28), BP 43.0 (SD 26), GH 37.5 (SD 40), SF 40.5 (SD 26), RE 42.9 (SD 33), MH 52.1 (SD 35), VT 32.0 (SD 32); **SCL-90-R:** somatization 53.3 (SD 32), obsessive-compulsive 63.1 (SD 28), interpersonal sensitivity 59.0 (SD 22), depression 56.6 (SD 35), anxiety 42.6 (SD 36), hostility 57.4 (SD 25), phobic anxiety 40.0 (SD 28), paranoid ideation 47.5 (SD 26), psychoticism 44.6 (SD 31), global severity index 60.5 (SD 27), positive symptom distress index 49.9 (SD 35), positive symptom total 55.8 (SD 26) | - |
| Milian 2013 (2) | WHOQOL-BREF  Tuebingen CD-25 | Generic  Disease-specific | **WHOQOL-BREF:** physical health 35.7 (SD 21.8), psychological health 45.4 (SD 18.8), social relationships 58.3 (SD 25.3), environment 73.6 (SD 14.3), overall score 20.8 (SD 15.3); **Tuebingen CD-25:** depression 30.6 (SD 27.7), sexual activity 48.9 (SD 30.4), environment 45.1 (SD 31.5), eating behavior 43.4 (SD 22.6), bodily restrictions 52.4 (SD 36.1), cognition 54.4 (SD 32.8), total score 43.6 (SD 23.5) | **WHOQOL-BREF:** physical health 66.7 (SD 27.3), psychological health 64.4 (SD 24.9), social relationships 77.8 (SD 16.1), environment 75.3 (SD 16.3), overall score 61.1 (SD 28.9); **Tuebingen CD-25:** depression 26.5 (SD 24.5), sexual activity 34.4 (SD 30.2), environment 29.6 (SD 24.3), eating behavior 17.3 (SD 14.6), bodily restrictions 31.9 (SD 27.0), cognition 29.4 (SD 27.9), total score 27.6 (SD 20.6) | - |
| Milian 2014 | SCL-90-R | Generic | - | Somatization 55.8 (SD 9.7), obsessive-compulsive 55.9 (SD 9.2), interpersonal sensitivity 54.0 (SD 8.8), depression 56.3 (SD 8.8), anxiety 53.3 (SD 8.6), hostility 52.7 (SD 9.7), phobic anxiety 51.6 (SD 9.3), paranoid ideation 50.5 (SD 9.5), psychoticism 53.9 (SD 9.0), global severity index 55.3 (SD 8.8), positive symptom distress index 54.1 (SD 9.5), positive symptom total 54.3 (SD 9.2) | - |
| Milian 2015 | SF-36  Tuebingen CD-25, CushingQoL | Generic  Disease-specific | - | **SF-36:** PF 71.8 (SD 26.5), RP 55.7 (SD 42.7), BP 65.8 (SD 30.4), GH 53.9 (SD 22.9), SF 70.5 (SD 27.9), RE 64.5 (SD 43.3), MH 62.5 (SD 21.2), VT 45.8 (SD 19.8); **Tuebingen CD-25:** depression 27.1 (SD 22.7), sexual activity 34.8 (SD 27.1), environment 30.9 (SD 22.8), eating behavior 22.6 (SD 22.6), bodily restrictions 28.3 (SD 25.9), cognition 40.2 (SD 30.9), total score 29.2 (SD 18.5); **CushingQoL:** 58.1 (SD 17.9) | - |
| Nelson 2013 | CushingQoL | Disease-specific | Trouble sleeping 2.4 (SD 1.2), pain 3.3 (SD 1.4), slow wound healing 3.2 (SD 1.4), bruising 2.4 (SD 1.3), irritability 2.6 (SD 1.1), self-confidence 3.0 (SD 1.3), physical appearance 1.8 (SD 1.0), going out with relatives or friends 2.9 (SD 1.2), give up social activities 3.0 (SD 1.4), work/study 2.7 (SD 1.4), memory 2.9 (SD 1.2), worrying future health 1.7 (SD 0.9), *total score 41.5 (SD 5.6)* | Trouble sleeping 2.9 (SD 1.2), pain 3.7 (SD 1.3), slow wound healing 3.5 (SD 1.3), bruising 2.6 (SD 1.3), irritability 3.0 (SD 1.0), self-confidence 3.4 (SD 1.1), physical appearance 2.2 (SD 1.2), going out with relatives or friends 3.3 (SD 1.2), give up social activities 3.4 (SD 1.4), work/study 3.1 (SD 1.4), memory 3.1 (SD 1.2), worrying future health 2.1 (SD 1.1), *total score 50.6 (SD 6.0)* | - |
| Papakokkinou 2015 | MFS | Domain-specific: fatigue | - | 13.5 (SD 7.4) | 7.8 (SD 4.9) |
| Papoian 2016 | CushingQoL | Disease-specific | - | Remission: 48 (SD 22); No remission: 27 (SD 17) | - |
| Pivonello 2014 | CushingQoL  BDI-II | Disease-specific  Domain-specific: depression | **CushingQoL:** 41.1 (SD 20.2);  **BDI:** 18.4 (SD 10.6) | *Controlled:* ***CushingQoL:*** *54.1 (SD 20.2);* ***BDI:*** *14.1 (SD 10.6); Partially controlled:* ***CushingQoL:*** *60.5 (SD 20.2);* ***BDI:*** *10.9 (SD 10.6); Uncontrolled:* ***CushingQoL:*** *47.0 (SD 20.2);* ***BDI:*** *14.1 (SD 10.6)1* | - |
| Psaras 2011 | SF-36, SCL-90-R | Generic | - | Remission: **SF-36:** PF 43.3 (SD 32.9), RP 40.1 (SD 34.2), BP 38.3 (SD 29.3), GH 31.6 (SD 31.6), SF 32.9 (SD 32.7), RE 58.3 (SD 27.3), MH 40.7 (SD 29.8), VT 36.9 (SD 31.5); **SCL-90-R:** Somatization 66.9 (SD 27.7), obsessive-compulsive 65.4 (SD 28.4), interpersonal sensitivity 59.9 (SD 27.0), depression 67.2 (SD 26.1), anxiety 61.7 (SD 27.5), hostility 59.3 (SD 26.4), phobic anxiety 52.8 (SD 27.6), paranoid ideation 52.8 (SD 29.6), psychoticism 61.1 (SD 31.5), global severity index 67.4 (SD 28.0), positive symptom distress index 58.7 (SD 27.5), positive symptom total 66.2 (SD 26.6); No remission: **SF-36:** PF 37.6 (SD 32.4), RP 25.0 (SD 23.1), BP 44.6 (SD 24.2), GH 39.7 (SD 37.8), SF 31.6 (SD 32.9), RE 26.0 (SD 29.3), MH 43.8 (SD 42.7), VT 47.2 (SD 38.0); **SCL-90-R:** Somatization 57.2 (SD 37.4), obsessive-compulsive 70.2 (SD 39.2), interpersonal sensitivity 60.2 (SD 34.6), depression 65.2 (SD 42.8), anxiety 42.2 (SD 36.6), hostility 60.4 (SD 27.5), phobic anxiety 53.8 (SD 33.7), paranoid ideation 55.0 (SD 27.3), psychoticism 62.8 (SD 28.5), global severity index 76.0 (SD 19.6), positive symptom distress index 62.6 (SD 34.0), positive symptom total 62.0 (SD 38.3) | **SF-36:** PF 52.2 (SD 25.2), RP 52.3 (SD 24.3), BP 45.4 (SD 22.5), GH 64.1 (SD 28.6), SF 56.4 (SD 26.9), RE 57.9 (SD 19.6), MH 64.7 (SD 28.5), VT 56.7 (SD 30.7); **SCL-90-R:** Somatization 54.9 (SD 29.2), obsessive-compulsive 56.4 (SD 24.7), interpersonal sensitivity 51.7 (SD 23.5), depression 49.2 (SD 21.1), anxiety 52.9 (SD 24.7), hostility 38.3 (SD 22.9), phobic anxiety 43.8 (SD 26.4), paranoid ideation 41.3 (SD 27.1), psychoticism 38.7 (SD 21.7), global severity index 52.3 (SD 23.7), positive symptom distress index 44.9 (SD 24.1), positive symptom total 53.7 (SD 23.4) |
| Ragnarsson 2014 | FIS | Domain-specific: fatigue | - | median 60 (range 27-82) | median 17 (range 5-37) |
| Ritvonen 2015 | 15D | Generic | - | 0.896 (SD 0.098) | 0.929 (SD 0.076) |
| Roset 2013 | SF-6D  CushingQoL | Generic  Disease-specific | - | **SF-6D:** 0.708 (SD 0.132);  **CushingQoL:** 52.92 (SD 21.92) | - |
| Santos 2012 | EuroQoL  CushingQoL | Generic  Disease-specific | Active disease: **EuroQoL:** 64 (± 20); **CushingQoL:** 46 (± 15); Improvement group: **EuroQoL:** 62 (± 20); **CushingQoL:** 41 (± 15) | Cured: **EuroQoL:** 70 (± 16); **CushingQoL:** 58 (± 20); Improvement group: **EuroQoL:** 78 (± 17); **CushingQoL:** 68 (± 17), | - |
| Santos 2015 | BDI-II | Domain-specific: depression | - | Active: **BDI-II:** 9 (3-19); Remission: **BDI-II:** 12 (0-23) | **BDI-II:** 2.5 (0-16) |
| Sonino 2006 | SRT | Generic | - | Anxiety 5.5 (SD 4.0), depression 4.8 (SD 3.6), somatic symptoms 3.9 (SD 3.1), anger hostility 3.9 (SD 3.9) cognitive symptoms 4.2 (3.6), psychotic symptoms 2.3 (SD 2.8), *total score 24.6 (SD 8.6)* | Anxiety 3.5 (SD 2.3), depression 2.7 (SD 1.8), somatic symptoms 3.1 (SD 2.0), anger hostility 2.3 (SD 1.8) cognitive symptoms 3.3 (3.6), psychotic symptoms 0.6 (SD 1.0), *total score 15.5 (SD 5.5)* |
| Sonino 2007 | PSI, SF-20 | Generic | - | **PSI:** stress 3.1 (SD 2.3), distress 11.9 (SD 6.7), abnormal illness behavior 0.8 (SD 0.9), well-being 5.2 (SD 0.9); **SF-20:** PF 6.4 (SD 4.0), role functioning 2.5 (SD 1.8), SF 1.3 (SD 2.0), MH 7.9 (SD 6.5), health perceptions 12.3 (SD 7.5), pain 1.0 (SD 1.0) | **PSI:** stress 1.5 (SD 1.5), distress 8.3 (SD 4.8), abnormal illness behavior 0.5 (SD 0.5), well-being 6.9 (SD 2.2); **SF-20:** PF 1.6 (SD 2.0), role functioning 0.3 (SD 0.7), SF 0.3 (SD 0.5), MH 5.1 (SD 3.4), health perceptions 7.5 (SD 2.7), pain 0.9 (SD 1.1) |
| Starkman 2007 | SCL-90-R | Generic | Depression 47.52 (SD 9.81), anxiety 44.78 (SD 7.79), obsessive-compulsive 49.91 (SD 9.78), paranoid 45.48 (SD 9.23), somatization 54.48 (SD 10.56) | Depression 38.39 (SD 7.73), anxiety 37.39 (SD 5.94), obsessive-compulsive 43.39 (SD 7.61), paranoid 40.48 (SD 8.39), somatization 45.52 (SD 0.28) | - |
| Szczesniak 2017 | WHOQOL-BREF, GHQ-28  AIS | Generic  Domain-specific: other | - | **WHOQOL-BREF:** physical health 48.57 (SD 12.9), psychological health 52.86 (SD 17.3), social relation 58.14 (SD 24.4), environmental 62.64 (SD 14.7); **GHQ-28:** 9.53 (SD 8.0), A 2.86 (SD 2.6), B 3.13 (SD 2.5), C 1.60 (SD 1.7), D 2.00 (SD 2.3); **AIS:** 28.2 | **WHOQOL-BREF:** physical health 60.48 (SD 7.5), psychological health 69.28 (SD 8.6), social relation 79.40 (SD 11.9), environmental 69.72 (SD 11.7); **GHQ-28:** 2.63 (SD 3.5), A 0.91 (SD 1.4), B 0.97 (SD 1.3), C 0.45 (SD 0.9), D 0.32 (SD 0.9) |
| Tiemensma 2010 | MASQ-30  AS, IS | Domain-specific: anxiety and depression  Domain-specific: other | - | **MASQ-30:** negative affect 18.2 (SD 6.7), positive affect 25.7 (SD 9.6), somatic arousal 17.4 (SD 6.6); **AS:** 14.8 (SD 6.5); **IS:** 11.5 (SD 7.7) | **MASQ-30:** negative affect 14.2 (SD 4.8), positive affect 32.1 (SD 7.6), somatic arousal 13.1 (SD 3.7); **AS:** 9.8 (SD 4.2); **IS:** 6.6 (SD 4.2) |
| Tiemensma 2011 | Physical symptoms checklist, EuroQoL-5D  CushingQoL | Generic  Disease-specific | - | **Physical symptoms checklist:** 40.8 (SD 26); **EuroQoL-5D:** mobility 1.4 (SD 1), self-care 1.1 (SD 0), activity 1.7 (SD 1), pain 1.8 (SD 1), anxiety 1.4 (SD 1), VAS 65.5 (SD 18); **CushingQoL:** 52 (SD 18) | - |
| Van Aken 2005 | SF-36, NHP  HADS  MFI-20 | Generic  Domain-specific: anxiety and depression  Domain-specific: fatigue | - | **SF-36:** PF 68 (SD 29), RP 65 (SD 41), BP 73 (SD 28), GH 54 (SD 25), SF 73 (SD 26), RE 67 (SD 42), CH 52 (SD 22); **NHP:** energy 35 (SD 40), pain 16 (SD 26), emotional reaction 21 (SD 30), sleep 22 (SD 32), physical ability 18 (SD 22), social isolation 13 (SD 24), *total score 20.8 (SD 29.6)*; **HADS:** anxiety 7 (SD 5), depression 5 (SD 5), total 12 (SD 9); **MFI-20:** general fatigue 13 (SD 5), physical fatigue 12 (SD 5), reduced activity 10 (SD 5), reduced motivation 10 (SD 5), mental fatigue 11 (SD 6), *total score 56 (SD 11.7)* | **SF-36:** PF 79 (SD 22), RP 77 (SD 37), BP 80 (SD 25), GH 69 (SD 22), SF 87 (SD 21), RE 84 (SD 32), CH 51 (SD 19); **NHP:** energy 14 (SD 26), pain 8 (SD 18), emotional reaction 9 (SD 16), sleep 16 (SD 25), physical ability 7 (SD 14), social isolation 6 (SD 16), *total score 10 (SD 19.7)*; **HADS:** anxiety 5 (SD 4), depression 4 (SD 3), total 8 (SD 4); **MFI-20:** general fatigue 10 (SD 5), physical fatigue 9 (SD 5), reduced activity 9 (SD 5), reduced motivation 8 (SD 4), mental fatigue 8 (SD 5), *total score 44 (SD 10.8)* |
| Van der Pas 2012 | NHP, SF-36  CushingQoL  HADS  MFI-20 | Generic  Disease-specific  Domain-specific: anxiety and depression  Domain-specific: fatigue | **NHP:** energy 68.0 (SD 41.6), pain 16.3 (SD 25.8), emotional reaction 29.5 (SD 21.5), sleep 38.7 (SD 32.6), physical ability 32.5 (SD 26.3), social isolation 17.1 (SD 28.1), *total score 33.7 (SD 30.0)*; **SF-36:** PF 54.4 (SD 25.1), RP 33.6 (SD 39.5), BP 75.3 (SD 23.6), GH 45.6 (SD 19.7), SF 59.4 (SD 26.4), RE 60.4 (SD 40.8), CH 25.0 (SD 28.9); **CushingQoL:** 42.3 (SD 16.3); **HADS:** anxiety 7.4 (SD 3.6), depression 6.9 (SD 4.3), total 14.3 (SD 7.0); **MFI-20:** general fatigue 15.8 (SD 4.7), physical fatigue 14.8 (SD 4.7), reduced activity 13.1 (SD 4.3), reduced motivation 11.4 (SD 4.3), mental fatigue 13.4 (SD 5.6), *total score* *68.5 (SD 10.6)* | - | **NHP:** energy 12.1 (SD 25.5), pain 7.5 (SD 18.4), emotional reaction 8.1 (SD 16.2), sleep 14.8 (SD 25.0), physical ability 8.5 (SD 13.9), social isolation 5.3 (SD 16.0), *total score 9.4 (SD 19.7)*; **SF-36:** PF 81.9 (SD 23.2), RP 79.4 (SD 35.5), BP 79.5 (SD 25.6), GH 72.7 (SD 22.7), SF 86.9 (SD 20.5), RE 84.1 (SD 32.3); **HADS:** anxiety 5.1 (SD 3.6), depression 3.4 (SD 3.3), total 8.4 (SD 6.3); **MFI-20:** general fatigue 9.9 (SD 5.2), physical fatigue 8.8 (SD 4.9), reduced activity 8.7 (SD 4.6), reduced motivation 8.2 (SD 4.0), mental fatigue 8.3 (SD 4.8), *total score* *43.9 (SD 10.5)* |
| Voigt 1985 | HRSD | Domain specific: depression | - | 4.2 (SD 4.9) | Not reported |
| Ye 2017 | SF-36 | Generic | PF 41.26 (SD 33.30), RP 21.34 (SD 36.47), BP 44.55 (SD 28.11), GH 36.17 (SD 24.63), SF 37.50 (SD 31.60), RE 37.50 (SD 43.49), MH 55.80 (SD 24.57), VT 24.30 (SD 22.52) | PF 61.87 (SD 37.22), RP 52.27 (SD 48.03), BP 58.45 (SD 23.58), GH 58.27 (SD 28.08), SF 68.18 (SD 36.81), RE 63.64 (SD 45.84), MH 65.55 (SD 27.35), VT 48.18 (SD 31.96) | PF 85.8, RP 82.1, BP 75.6, GH 77, SF 86.2, RE 84, MH 77.5, VT 65.8 |
| *Cognitive performance* |  |  |  |  |  |
| Andela 2013 | CFQ | Memory | - | 38.0 (SD 16.5) | 27.6 (SD 9.7) |
| Crespo 2014 | IGT | Executive functioning | - | Safe cards: 50.4 (SD 10.8),  riskier cards: 49.6 (SD 10.8), amount of money obtained: -1188.9 (SD 1058.4) | Safe cards: 58.3 (SD 15.6),  riskier cards: 43.9 (SD 15.9), amount of money obtained: -620.4 (SD 1470.7) |
| Dorn 2000 | WAIS-R | Intelligence | 100.0 (SD 14.2) | 101.5 (SD 15.0) | Start of study: 106.5 (SD 16.1); after 12 months: 109.1 (SD 16.8) |
| Fleseriu 2012 | TMT | Executive functioning | Improved by 4.0 seconds in trail A (p<0.01) and 12 seconds in trail B (p<0.01) | Improved by 4.0 seconds in trail A (p<0.01) and 12 seconds in trail B (p<0.01) | - |
| Forget 2016 | WAIS-R  visual target detection, DSST, three-target detection, JLO, Bells test, HVOT, block design, digit span  TMT, SCWT  CVLT, BVRT, WMS  similarities, RPM | Intelligence  Attention  Executive functioning  Memory  Concept formation | **WAIS-R:** 93.5 (SD 9.6); **Visual target detection:** 3.79 (SD 1.08) items/second; **DSST:** 0.55 (SD 0.13) items/second; **three-target detection:** 1.41 (SD 0.25); **JLO:** 21.9 (SD 4.6); **Bells test:** 3.7 (SD 1.74); **HVOT:** 25.4 (SD 4.4); **block design:** 27.8 (SD 13.01); **digit span:** 13.5 (SD 3.2); **TMT:** A0.88 (SD 0.37), B 0.40 (SD 0.14) items/second; **SCWT:** 38.2 (SD 9.0); **CVLT:** verbal learning: first trial 7.2 (SD 2.6), fifth trial 12.9 (SD 3.2), first five trials 53.8 (SD 12.8); verbal memory: short-term free recall 11.5 (SD 3.5), long-term free recall 12.3 (SD 3.5), recognition 15.0 (SD 1.1); list B 5.6 (SD 2.2); **BVRT:** immediate recall 8.4 (SD 1.8), long-term recall 9.05 (SD 1.5); **WMS:** immediate recall 9.80 (SD 3.7), long-term recall 11.6 (SD 3.06), copy 13.9 (SD 1.6); **similarities:** 18.1 (SD 5.6); **RPM:** 42.7 (SD 14.2) | **WAIS-R:** 102.5 (SD 13.5); **Visual target detection:** 4.21 (SD 0.75) items/second; **DSST:** 0.65 (SD 0.15) items/second; **three-target detection:** 1.44 (SD 0.39); **JLO:** 23.4 (SD 5.9); **Bells test:** 3.7 (SD 1.2); **HVOT:** 26.3 (SD 4.3); **block design:** 34.8 (SD 14.2); **digit span:** 15.6 (SD 4.6); **TMT:** A1.01 (SD 0.33), B 0.49 (SD 0.15) items/second; **SCWT:** 44.3 (SD 13.5); **CVLT:** verbal learning: first trial 9.1 (SD 2.6), fifth trial 14.0 (SD 3.0), first five trials 61.6 (SD 13.6); verbal memory: short-term free recall 13.1 (SD 3.7), long-term free recall 14.3 (SD 2.5), recognition 15.5 (SD 1.6); list B 6.5 (SD 2.5); **BVRT** immediate recall 9.0 (SD 1.2), long-term recall 9.3 (SD 1.1); **WMS:** immediate recall 11.9 (SD 2.5), long-term recall 13.1 (SD 1.8), copy 13.3 (SD 2.3); **similarities:** 18.5 (SD 4.9); **RPM:** 45.3 (SD 10.3) | **WAIS-R:** 105.7 (SD 13.4); **Visual target detection:** 4.8 (SD 1.17) items/second; **DSST:** 0.67 (SD 0.14) items/second; **three-target detection:** 1.67 (SD 0.41); **JLO** 21.33 (SD 5.6); **Bells test:** 4.05 (SD 1.7); **HVOT:** 26.5 (SD 2.2); **block design:** 32.56 (SD 9.7); **digit span:** 14.6 (SD 3.4); **TMT:** A1.05 (SD 0.39), B 0.55 (SD 0.24) items/second; **SCWT:** 45.6 (SD 8.5); **CVLT:** verbal learning: first trial 8.0 (SD 2.5), fifth trial 14.2 (SD 1.92), first five trials 59.6 (SD 9.2); verbal memory: short-term free recall 12.5 (SD 2.5), long-term free recall 13.6 (SD 2.4), recognition 14.9 (SD 1.05); list B 7.6 (SD 2.4); **BVRT:** immediate recall 8.4 (SD 1.4), long-term recall 8.75 (SD 1.4); **WMS:** immediate recall 14.0 (SD 1.7), long-term recall 11.4 (SD 2.9), copy 14.6 (SD 0.6); **similarities:** 22.1 (SD 4.3); **RPM:** 48.4 (SD 10.3) |
| Heald 2006 | SCWT, TMT  AMIPB  TEA | Executive functioning  Memory  Attention | - | **SCWT:** 91.4 (SD 20.5); **TMT-B:** time: 76.5 (IQR 48-105); **AMIPB:** task A 62.6 (SD 17.9), story recall 80.5 (IQR 68-93); **TEA:** 5.9 (SD 3.2) | **TMT-B:** time: 63.76 (SD 14.42); **AMIPB:** task A 62.1 (SD 16), story recall 93.1 (SD 13.9); **TEA:** 9 (SD 1.1) |
| Hook 2007 | SR  verbal fluency | Memory  Executive functioning | **SR:** 63.63 (SD 12.31);  **verbal fluency:** 16.89 (SD 5.82) | **SR:**72.03 (SD 10.70);  **verbal fluency:** 21.22 (SD 5.20) | - |
| León-Carrión 2009 | SLCT, CLCT  SCWT, tower of Hanoi  LMW-R | Attention  Executive functioning  Memory | **SLCT:** 100% correct (100-98), mean RT 0.53 (0.63-0.43); **CLCT:** 98% correct (96-100), mean RT 0.46 (0.63-0.40); **SCWT:** 0 errors (0-5), mean RT 1.5 (1.4-1.7); **tower of Hanoi:** 11 correct movements (9-13.25), 5 errors (2.75-15.25), 166.98 total time (106.22-290.25); **LMW-R:** true recall index 8.13 (SD 0.89), contamination index 5.44 (SD 3.77), memory gain 39.48 (SD 11.76), self-knowledge index -0.38 (SD 0.37), index of learning 1: 0.524 (SD 0.77), index of learning 2: 1.58 (SD 0.79), index of learning 3: 2.10 (SD 0.85), primacy effect 1.45 (SD 1.42), recency effect 0.5967 (SD 1.16), consolidation index 80.67 (SD 14.86) | - | **SLCT:** 100% correct (100-100), mean RT 0.45 (0.42-0.51); **CLCT:** 100% correct (98-100), mean RT 0.43 (0.39-0.48); **SCWT:** 0 errors (0-0), mean RT 1.5 (1.3-1.6); **tower of Hanoi:** 11 correct movements (9-16), 6 errors (2-8), 109.01 total time (45.27-183.8); **LMW-R:** true recall index 9.28 (SD 0.46), contamination index 2.30 (SD 3.19), memory gain 32.66 (SD 9.61), self-knowledge index 0.15 (SD 0.40), index of learning 1: 0.1833 (SD 0.24), index of learning 2: 1.33 (SD 0.50), index of learning 3: 1.3607 (SD 0.59), primacy effect 0.71 (SD 0.81), recency effect 0.5753 (SD 0.80), consolidation index 98 (SD 7.75) |
| Mauri 1993 | Logic memory, serial learning test, Corsi's test, visual reproduction  digit span, DSST, cancellation test  RPM, similarities  TMT, word fluency, Street's test | Memory  Attention  Concept formation  Executive functioning | **Logic memory:** learning 6.3 (SD 2.2), retrieval 7.1 (SD 3.1); **serial learning test:** primacy 4.4 (SD 1.5), recency 14.3 (SD 3.7) correct; **Corsi's test:** 5.5 (SD 1.0); **visual reproduction:** learning 8.8 (SD 3.7), retrieval 6.8 (SD 3.9); **digit span:** forward 5.6 (SD 1.0), backward 3.5 (SD 0.8), *total 9.1 (SD 1.3)*; **DSST:** 36.8 (SD 14.1); **cancellation test:** 53.8 (SD 6.0); **RPM:** 26.2 (SD 4.4); **similarities:** 13.4 (SD 2.6); **TMT:** A 45.4 (SD 7.9), B 75.8 (SD 13.7); **word fluency:** 18.9 (SD 5.1) in 2 minutes; **Street's test:** 7.4 (SD 2.0) | (n=8 tested postoperatively)  **Logic memory:** learning 9.4 (SD 2.3), retrieval 10.7 (SD 2.5); **serial learning test:** primacy 5.0 (SD 0.9), recency 14.6 (SD 1.9) correct; **Corsi's test:** 5.9 (SD 0.6); **visual reproduction:** learning 10.8 (SD 2.9), retrieval 8.9 (SD 2.5); **digit span:** forward 6.2 (SD 1.0), backward 3.7 (SD 0.5), *total 9.9 (SD 1.1)*; **DSST:** 46.7 (SD 17.3); **cancellation test:** 56.4 (SD 2.2); **RPM:** 29.0 (SD 4.0); **similarities:** 14.6 (SD 2.2); **TMT:** A 42.1 (SD 8.6), B 64.5 (SD 11.0); **word fluency:** 19.9 (SD 5.3) in 2 minutes; **Street's test:** 8.2 (SD 1.3) | **Logic memory:** learning 8.2 (SD 2.4), retrieval 10.0 (SD 2.5); **serial learning test:** primacy 5.5 (SD 1.4), recency 15.1 (SD 3.5) correct; **Corsi's test:** 5.7 (SD 0.9); **visual reproduction:** learning 10.9 (SD 2.2), retrieval 10.0 (SD 2.2); **digit span:** forward 5.5 (SD 1.2), backward 4.1 (SD 0.8), *total 9.6 (SD 1.4)*; **DSST:** 47.3 (SD 11.2); **cancellation test:** 54.2 (SD 4.6); **RPM:** 26.9 (SD 3.8); **similarities:** 14.0 (SD 3.3); **TMT:** A 42.3 (SD 8.0), B 69.9 (SD 11.4); **word fluency:** 20.4 (SD 4.2) in 2 minutes; **Street's test:** 7.8 (SD 1.2) |
| Papakokkinou 2015 | TMT | Executive functioning | - | Part A: 30 (26-40, *SD 24.9*), part B: 71 (58-98, *SD 71.1*), part C: 80 (56-119, *SD 112.0*), part D: 165 (122-236, *SD 202.7*) seconds | Part A: 27 (23-36, *SD 23.1*), part B: 65 (50-96, *SD 81.8*), part C: 62 (46-96, *SD 88.9*), part D: 124 (84-191, *SD 190.2*) seconds |
| Psaras 2011 | Letter cancellation task, DST, digit span  verbal memory test  TMT | Attention  Memory  Executive functioning | - | Remission: **Letter cancellation task:** speed 33.5 (SD 25.1), accuracy 46.1 (SD 24.7), overall performance 39.5 (SD 26.9); **DST:** 78.3 (SD 28.5); **digit span:** 45.6 (SD 16.9); **verbal memory test:** 75.1 (SD 26.5), **TMT-A:** 57.9 (SD 33.3); No remission: **Letter cancellation task:** speed 29.3 (SD 38.0), accuracy 35.7 (SD 19.3), overall performance 27.3 (SD 30.6); **DST:** 64.9 (SD 23.3); **digit span:** 33.4 (SD 12.7); **verbal memory test:** 46.0 (SD 34.7); **TMT-A:** 38.3 (SD 42.2) | **Letter cancellation task:** speed 35.3 (SD 28.3), accuracy 61.6 (SD 25.7), overall performance 44.2 (SD 27.5); **DST:** 75.5 (SD 23.1); **digit span:** 60.5 (SD 23.7); **verbal memory test:** 63.4 (SD 35.2); **TMT-A:** 46.3 (SD 37.2) |
| Ragnarsson 2014 | WAIS  FAS, DLS | Intelligence  Executive functioning | - | **WAIS:** Digit symbol coding: 0.55 (0.49-0.65, *SD 0.29*) codes/second; digit span: 16 (13-20, *SD 12.7*); spatial span:15 (12-16, *SD 7.3*); **FAS:** 45 (33-56, *SD 41.7*) words/minute; **DLS:** 2.3 (1.9-2.5) words/second | **WAIS:** Digit symbol coding: 0.62 (0.54-0.73, *SD 0.34*) codes/second; digit span: 18 (15-22, *SD 12.7*); spatial span:15 (13-18, *SD 9.1*); **FAS:** 57 (43-62, *SD 34.5*) words/minute; **DLS:** 2.6 (2.0-3.4) words/second |
| Starkman 1992 | WMS | Memory | Mean 101.7 (SD 13.6), memory index mean 1.68 (SD 0.43), verbal recall index 0.82 (SD 0.25), visual recall index 0.86 (SD 0.23) | - | 100 (SD 15) |
| Starkman 2003 | WMS-Russell modification  vocabulary  arithmetic | Memory  Executive functioning  Attention | **WMS:** logical memory 8.13 (SD 3.06), paired associates 15.70 (SD 4.22), logical memory delayed 6.50 (SD 2.67), paired associates delayed 8.83 (SD 1.40); **vocabulary:** 9.95 (SD 2.82); **arithmetic:** 9.91 (SD 2.45) | **WMS:** logical memory 8.89 (SD 3.19), paired associates 17.39 (SD 3.50), logical memory delayed 7.48 (SD 3.04), paired associates delayed 9.26 (SD 1.10); **vocabulary:** 10.18 (SD 2.70); **arithmetic:** 10.50 (SD 2.79) | - |
| Tiemensma 2010 (2) | MMSE, WMS, RAVLT, ROCFT  TMT, SCWT, figure fluency test, FAS  LDST, digit-deletion test  synonyms subtest of the GIT-2 | Memory  Executive functioning  Attention  Intelligence | - | **MMSE:** 27.9 (SD 1.9); **WMS:** MQ 109.0 (SD 16.8), information 5.8 (SD 0.4), orientation 4.9 (SD 0.2), concentration 7.0 (SD 2.0), logical memory 6.3 (SD 3.2), digit span 9.9 (SD 1.9), visual memory 8.1 (SD 3.0), associative learning 16.0 (SD 3.4); **RAVLT:** imprinting total 5.8 (SD 2.1), immediate total 9.4 (SD 2.7), delayed total 7.5 (SD 3.0); **ROCFT:** immediate 17.2 (SD 6.0), delayed 16.7 (SD 6.3); **TMT:** A: time 0.4 (SD 0.3), errors 0.1 (SD 0.3), B: time 1.3 (SD 1.3), errors 0.7 (SD 1.7); **SCWT:** interference total 39.8 (SD 11.0), interference mistakes 0.3 (SD 0.8); **figure fluency test:** patterns 62.0 (SD 23.4), % repeats 9.0 (SD 11.3), % errors 17.2 (SD 12.3); **FAS:** correct 33.1 (SD 14.8), % repeats 1.8 (SD 2.8), % errors 2.1 (SD 3.8); **LDST:** correct 31.6 (SD 8.0), errors 0.1 (SD 0.2); **digit-deletion test:** correct 376.5 (SD 102.2), errors 5.0 (SD 5.2); **synonyms subtest of the GIT-2:** 4.5 (SD 1.9) | **MMSE:** 28.3 (SD 2.0); **WMS:** MQ 115.6 (SD 15.6), information 5.9 (SD 0.4), orientation 5.0 (SD 0.2), concentration 7.7 (SD 1.4), logical memory 7.1 (SD 3.2), digit span 10.3 (SD 1.8), visual memory 9.2 (SD 3.4), associative learning 17.2 (SD 2.8); **RAVLT:** imprinting total 6.3 (SD 2.2), immediate total 11.0 (SD 2.3), delayed total 9.4 (SD 3.2); **ROCFT:** immediate 18.9 (SD 6.7), delayed 18.6 (SD 6.8); **TMT:** A: time 0.4 (SD 0.4), errors 0.2 (SD 0.4), B: time 1.2 (SD 0.9), errors 0.7 (SD 2.2); **SCWT:** interference total 42.0 (SD 10.6), interference mistakes 0.2 (SD 0.5); **figure fluency test:** patterns 66.9 (SD 22.7), % repeats 6.2 (SD 5.7), % errors 16.9 (SD 13.1); **FAS:** correct 36.2 (SD 13.3), % repeats 1.2 (SD 2.5), % errors 1.5 (SD 4.8); **LDST:** correct 34.2 (SD 7.9), errors 0.1 (SD 0.3); **digit-deletion test:** correct 409.7 (SD 91.3), errors 4.3 (SD 4.8); **synonyms subtest of the GIT-2:** 4.5 (SD 1.8) |

SD=standard deviation, SEM=standard error of the mean, RT=reaction time. For explanation of abbreviated questionnaire and test names, see Table 1.  
Italics: calculated outcomes.  
Milian 2013 (2) = Neuroendocrinology 2013;98:188–199. Tiemensma 2010 (2) = J Clin Endocrinol Metab 2010;95:2699–2714.  
1Estimates are calculated from values from table 1 (before surgery) and table 2 (difference between before and after surgery). Standard deviations are imputed from measurement before surgery.

Table 4: List of (abbreviated) questionnaire and test names.

|  |  |  |
| --- | --- | --- |
| **Type of scale** | **Name** | **Domain** |
| Quality of life: Generic | 15D: producing a 15-dimensional profile and a single index score |  |
|  | EuroQoL(-5D): European Quality of Life Scale |  |
|  | GHQ-28: General Health Questionnaire |  |
|  | NHP: Nottingham Health Profile |  |
|  | Physical symptoms checklist |  |
|  | PSI: Psychosocial Index |  |
|  | SCL-90(-R): Symptom Checklist (-revised) |  |
|  | SF-36/SF-6D/SF-20: Short Form health survey  Subscales:  PCS: Physical component summary  MCS: Mental component summary  PF: Physical functioning  RP: Role physical  BP: Bodily pain  GH: General health  VT: Vitality  SF: Social functioning  RE: Role emotional  MH: Mental health  CH: Change in health |  |
|  | SIP: Sickness Impact Profile |  |
|  | SRT: Symptom Rating Test |  |
|  | WHOQoL-BREF: World Health Organization Quality of Life Scale – abbreviated version |  |
| Quality of life: Disease specific | CushingQoL: Cushing Quality of Life questionnaire |  |
|  | Tuebingen CD-25: Tuebingen Cushing’s disease quality of life inventory |  |
| Quality of life: Domain specific | AFQ: Abbreviated Fatigue Questionnaire | Fatigue |
|  | AIS: Acceptance of Illness Scale | Acceptance |
|  | AS: Apathy Scale | Apathy |
|  | BAI: Beck Anxiety Inventory | Anxiety |
|  | BDI(-II): Beck Depression Inventory (-II) | Depression |
|  | CIS: Checklist Individual Strength | Fatigue |
|  | FACT: Functional Assessment of Cancer Therapy  Subscales: G: General F: Fatigue | Functioning during cancer treatment |
|  | FIS: Fatigue Impact Scale | Fatigue |
|  | FQ: Fear Questionnaire | Anxiety |
|  | HADS(-UK): Hospital Anxiety and Depression Scale (-UK version) | Anxiety, depression |
|  | HRSD: Hamilton Rating Scale for Depression | Depression |
|  | IDS: Inventory of Depression Symptomatology | Depression |
|  | IS: Irritability Scale | Irritability |
|  | MADRS: Montgomery-Åsberg Depression Rating Scale | Depression |
|  | MASQ-30: Mood and Anxiety Symptoms Questionnaire short-form | Anxiety, depression |
|  | MBSRQ: Multidimensional Body-Self Relations Questionnaire | Body-self relations |
|  | MFI-20: Multidimensional Fatigue Inventory | Fatigue |
|  | MFS: Mental Fatigue Scale | Fatigue |
|  | POMS: Profile of Mood States | Mood |
|  | SAS: Social Adjustment Scale – modified  Subscales: 1: Scored by patient 2: Scored by informant, who knows the patient well | Social adjustment |
|  | STAI: State Trait Anxiety Inventory | Anxiety |
| Cognitive performance | AMIPB: Adult Memory and Information Processing Battery | Memory |
|  | Arithmetic | Arithmetic reasoning |
|  | Bells test | Attention/perception |
|  | Block design | Construction |
|  | BVRT: Benton Visual Retention Test | Memory |
|  | Cancellation tests:  CLCT: Conditional letter cancellation task  Letter cancellation task  SLCT: Simple Letter Cancellation Task | Attention/perception |
|  | CFQ: Cognitive Failures Questionnaire | Memory |
|  | Corsi’s test | Memory |
|  | CVLT: California-Verbal Learning Test | Memory |
|  | Digit-deletion test | Attention/perception |
|  | DLS: Reading speed test | Verbal skills |
|  | Figure fluency test | Executive functioning |
|  | GIT-2: Groninger Intelligence Test-2  Subtests:  Synonyms subtest | Intelligence  Intelligence |
|  | HVOT: Hooper Visual Organization Test | Perception |
|  | IGT: Iowa Gambling Task (computerized) | Decision making |
|  | JLO: Judgment of Line Orientation | Perception |
|  | LDST: Letter-Digit Substitution Test | Attention |
|  | LMW-R: Luria’s Memory Words – Revised Task (computerized) | Memory |
|  | MMSE: Mini-Mental-State-Examination | Memory/executive functioning |
|  | RAVLT: Rey Auditory Verbal Learning Test | Memory |
|  | ROCFT: Rey-Osterrieth Complex Figure Test | Memory |
|  | RPM: Raven's Progressive Matrices | Concept formation |
|  | SCWT: Stroop Color-Word Test | Executive functioning |
|  | Serial learning test | Memory |
|  | SR: Selective Reminding | Memory |
|  | Street Completion Test | Perception |
|  | TEA: Test of Everyday Attention | Attention |
|  | Three-target detection | Attention |
|  | TMT: Trail Making Test | Executive functioning/attention |
|  | Tower of Hanoi | Executive functioning |
|  | Verbal fluency test  Including:  FAS  Word fluency | Executive functioning  Executive functioning/verbal skills  Executive functioning |
|  | Intelligence Structure Test-2000  Subtest:  Verbal memory test | Intelligence  Memory |
|  | Visual target detection | Attention |
|  | WAIS-R: Wechsler Adult Intelligence Scale – Revised  Subtests:  Digit span  DS(S)T: Digit Symbol (Substitution) Test  Similarities  Vocabulary | Intelligence  Attention/memory  Attention  Concept formation  Verbal skills |
|  | WMS(-Russell modification): Wechsler Memory Scale  Subtests:  Digit span  Logic memory  Visual reproduction | Memory  Attention/memory  Memory  Memory |