**Appendix III.** Detailed overview of tumour-related factors explored and their association with health-related quality of life (HRQOL).

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| **Factor** | **First Author (Year)** | **Results** |
| Tumour size | Castle-Kirzbaum (2022) | ↑ tumour size associated with ↓ preoperative HRQOL via ASBQ (β=−1.6, p=0.04) ­ |
| Jakola (2012) | No association between tumour volume and preoperative SF-36 scores (p=0.342) |
| Kofoed Lauridsen (2022) | No association between tumour volume and HRQOL via FACT-G/BR scores (p≥0.05) |
| Meixensberger (1996) | No association between tumour size and HRQOL via KPS 6mo post-surgery (p≥0.05) |
| Ouyang (2015) | ↑ tumour size associated with ↓ postoperative KPS only on univariate analysis (p=0.034) |
| Wirsching (2020) | No association between tumour size (<40mm vs ≥40mm) and EORTC QLQ-C30/BN20 scores (p=0.11) |
| Zamanipoor Najafabadi (2021b) | ↑ tumour size before study participation associated with ↓ PCS scores (Δ=−0.245 [95% CI: −0.450 to −0.020], p<0.05)No association between tumour size before intervention and HRQOL (p≥0.05) |
| Zweckberger (2019) | No association between tumour size and HRQOL via EORTC QLQ-C30 (p≥0.05) |
| Tumour location | Fisher (2021) | Anterior/middle skull-base MGM associated with ↑ HRQOL in physical role functioning via SF-36 (D̅=17.1 [95% CI: 0.2 to 34.0], and motor dysfunction (D̅=−10.1 [95% CI: −17.5 to −2.7]), communication deficit (D̅=−14.2 [95% CI: −22.7 to −5.6]), and weakness in both legs (D̅=−10.1 [95% CI: −18.8 to −1.5]) via EORTC QLQ-BN20 compared to posterior skull-base MGMNo significant differences between convexity and skull-base meningiomas via SF-36 (p≥0.05) |
| Jakola (2012) | Skull-base MGM tended to have ↓ preoperative SF-36 values compared to other locations (p=0.082), but no association between tumour location and postoperative HRQOL in the short-term (p=0.491) or long-term (p=0.896) |
| Keshwara (2022) | No association between tumour location (skull base vs other locations) and HRQOL via EORTC QLQ-C30 (p=0.932) |
| Lisowski (2022) | No association between tumour location and HRQOL via EORTC QLQ-C30/BN20 (p≥0.05) |
| Meixensberger (1996) | No association between tumour location with HRQOL via KPS 6mo post-surgery (p≥0.05) |
| Ouyang (2015) | No association between tumour location (medial vs middle/lateral) and postoperative KPS (p≥0.05) |
| Wagner (2019) | No association between tumour location (skull base vs frontal) and EQ-5D-5L scores (p=0.554 and p=0.282) |
| Wirsching (2020) | No association between tumour location (skull base vs other) and EORTC QLQ-C30/BN20 scores (p=0.26) |
| Zamanipoor Najafabadi (2021b) | No association between tumour location (skull base vs convexity) and HRQOL via SF-36 (p≥0.05) |
| Zweckberger (2019) | No association between tumour location and EORTC QLQ-C30 scores (p≥0.05) |
| Tumour laterality | Benz (2018) | Right-sided tumours associated with ↑ rate & severity of symptoms compared to left-sided tumours, including visual disturbance, headache, nausea/vomiting, weakness or motor deficit (all p<0.05) |
| Kalkanis (2000) | No association between tumour laterality and HRQOL via FACT-Br (p=0.5) |
| Kangas (2012) | Left-sided tumours associated with ↓ FACT functional well-being scores compared to right-sided tumours (D̅=3.2, p=0.009) |
| Keshwara (2022) | No association between tumour laterality and HRQOL via EORTC QLQ-C30/BN20 (p=0.769) |
| Histologic grade | Ganefianty (2020) | ↑ tumour grade associated with ↓ postoperative EORTC QLQ-C30 scores (OR=0.162, p=0.0001) on univariate analysis only |
| Meixensberger (1996) | No association between histologic grade and HRQOL via KPS 6mo post-surgery (p≥0.05) |
| Wirsching (2020) | No association between histologic grade (WHO I vs II/III) and HRQOL via EORTC QLQ-C30/BN20 (p=0.84) |
| Other tumour characteristics | Ouyang (2015) | Adhesion to adjacent structures (EXP(β)=0.161 [95% CI: 0.027 to 0.962]), encasement of neurovascular structures (EXP(β)=0.102 [95% CI: 0.009 to 1.203]), and rich blood supply (EXP(β)=0.067 [95% CI: 0.006 to 0.698]) (all p<0.05) associated with ↓ postoperative KPS improvement |
| Peritumoural brain edema | Kofoed Lauridsen (2022) | No association between PTBE and HRQOL via FACT-G/Br (p≥0.05) |
| Nassar (2022) | PTBE associated with ↓ KPS at 3mo post-surgery (χ2=6.44, p=0.011)Preoperative KPS scores and KPS scores at 2yrs post-surgery slightly ↑ in patients with no PTBE, but the differences were insignificant |
| Ouyang (2015) | PTBE associated with ↓ postoperative HRQOL via KPS only on univariate analysis (p=0.044) |
| Epilepsy | Tanti (2017) | MGM patients with epilepsy had impaired scores in all SF-36 domains compared to MGM patients with no epilepsy, except bodily pain, and significant differences on FACT-Br summary scores (D̅=−14.4, p=0.012)MGM patients with epilepsy had ↓ PCS + MCS scores compared to age-adjusted USA population normsEpilepsy and seizures in past 6mo not associated with ↓ HRQOL scores in MGM patients on multiple regression analyses |
| Sensory dysfunction | Castle-Kirzbaum (2018) | Visual dysfunction associated with ↓ preoperative HRQOL via ASBQ (β=−18.1, p=0.04)No association between olfaction/taste and overall postoperative HRQOL via ASBQ (p≥0.05) |
| Jones (2016) | No association between preoperative visual loss or postoperative visual improvement and HRQOL via ASBQ (p≥0.05) |
| Karsy (2019) | No association between vision changes or tinnitus and EQ-5D-5L scores (p≥0.05) |
| Ouyang (2015) | No association between impaired visual acuity and postoperative HRQOL via KPS (p≥0.05) |
| Pintea (2018) | Hypoacusis/anacusis associated with ↓ scores in vitality domain of SF-36 (β=0.312, p<0.026) |
| Neurological function | Pettersson-Segerlind (2021) | ↓ postoperative neurological function via mMCS grade associated with ↓ scores in mobility domain of EQ-5D (p=0.023) |
| Waagemans (2011) | ↓ executive functioning associated with ↓ physical functioning, role-physical, role-emotional, general health, vitality, social functioning, and mental health scores, and ↑ bodily pain scores on SF-36 (all p<0.05) |
| Wagner (2019) | ↑ improvement in neurological function via mRS scores associated with ↑ MCS scores\* |
| Other neurological issues | Karsy (2019) | No optic nerve decompression associated with ↑ EQ-5D-5L scores at 1 year (p<0.05)Absence of proptosis associated with ↑ EQ-5D-5L scores at 1 year (p<0.05)No association between ambulation deficits or new cranial nerve deficits and HRQOL (p≥0.05) |
| Meixensberger (1996) | Initial presentation with intracranial hypertension, seizures, aphasia, hemiparesis associated with ↑ increase in postoperative KPS (p<0.001) |
| Pintea (2018) | Swallowing disturbances associated with ↓ scores in physical functioning on SF-36 (β=−0.393, p<0.004)Hemiparesis/hemiataxia associated with ↓ scores in physical functioning (β=−0.384, p<0.005), vitality, social functioning (β=−0.327, p<0.019), and PCS (β=−0.290, p<0.048) |
| Tanti (2017) | ↑ MGM complications associated with ↓ PCS (β=−0.236, p=0.003), MCS (β=−0.166, p=0.04) and FACT (β=−0.234, p=0.01) scoresMotor/sensory issues associated with ↓ FACT scores (β=−0.139, p=0.043) |
| Wirsching (2020) | No association between presence of postoperative neurological deficits and HRQOL via EORTC QLQ-C30/BN20 (p≥0.05) |
| Zweckberger (2019) | No association between preoperative neurological symptoms and EORTC QLQ-C30 scores (p≥0.05) |
| Symptoms | Henzel (2013) | No association between improvement in symptoms and SF-36 score (p>0.05) |
| Kofoed Lauridsen (2022) | ↓ symptoms at diagnosis associated with ↑ long-term FACT-G/Br scores (FACT-G: p=0.024 and FACT-Br: p=0.019) |
| Time since diagnosis | Kangas (2012) | No associations between time since diagnosis and any of FACT-G subscales (all p>0.05)↓ time since initial diagnosis related to ↓ total FACT-G/Br score (β=−0.22, t=−2.57, p=0.013) |
| Keshwara (2022) | No association between duration of follow-up and EORTC QLQ-C30/BN20 scores (p=0.586) |
| Recurrence | Jones (2016) | No association between tumour recurrence and HRQOL via ASBQ (p≥0.05) |
| Karsy (2019) | No association between tumour recurrence and change in preoperative to follow-up EQ-5D-3L score (p≥0.05) |
| Kofoed Lauridsen (2022) | No association between number of recurrences and HRQOL via FACT-G/Br (p≥0.05) |
| Tanti (2017) | No association between tumour recurrence and SF-36 or FACT scores (p≥0.05) |

***Notes:*** *ASBQ=Anterior Skull Base Questionnaire; BL=baseline; CI=confidence interval; CSF=cerebrospinal fluid; EORTC QLQ BN20=European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Brain Neoplasm 20; EORTC QLQ C30=European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30; EQ-5D=EuroQOL-5 Dimensions; EXP(β)=exponentiated regression coefficient; FACT-Br=Functional Assessment of Cancer Therapy-Brain; FACT-G=Functional Assessment of Cancer Therapy-General; HRQOL=health-related quality of life; KPS=Karnofsky performance scale; MCS=mental component scale (from SF-36); md=median; MGM=meningioma; mRS=modified Rankin scale; mMCS=modified McCormick scale; OR=odds ratio; p=p-value; PCS=physical component scale (from SF-36); PTBE=peritumoural brain edema; RR=relative risk; SF-36=36-item Short Form Survey; SNOT-22=Sino-nasal Outcome Test-22; SRT=stereotactic radiotherapy; USA=United States of America; β=regression coefficient; D̅=difference between means; r=correlation coefficient; rs=Spearman’s Rho; χ2=chi-square; x̅=mean ± standard deviation; ↑=increase(d); ↓=decrease(d); Δ=change in score*

*\*margin of error not reported*