

Quality of life and work ability of ovarian cancer patients in Slovakia

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The aim of this paper was to find out the association of relevant factors on health-related quality of life (HRQOL) among ovarian cancer patients and their ability to work. Analyzed data were prospectively collected on 123 ovarian cancer patients enrolled across multiple oncology practices in Slovakia. We examined knowledge about the disease, negative perceptions related to health care, ability to work and social and economic ranking. HRQOL measurements included quality of life based on a numeric scale (1-worst, 10-best) and selected aspects from QoL-Ov28 questionnaire. We have used non-parametric Friedman and Dunne pairwise comparison tests to detect differences in HRQOL and the ability to work. Spearman correlation was used to measure the strength of association between variables. With hindsight, patients identified first signs of disease 3.6 months prior to diagnosis, with median duration of disease being 3.1 years. HRQOL was significantly different at various points during cancer journey; between current state and at diagnosis (4.19), between current state and at time without cancer or at time in full health (8.94, 9.52 respectively). Similarly, significant differences were noted in patients' current work ability (WA) compared to WA at diagnosis, or at time without cancer or in full health (4.2, 9.07, 9.58). The highest correlation of HRQOL was found in relation to current ability to work ($r = 0.87$) and in impact of cancer treatment ($r = 0.66$). Medium correlation was noted with visits to oncology clinics, knowledge about cancer, salary, future expectations or perceived quality of life of relatives ($r < 0.51$). Low correlation ($r < 0.3$) was found with other aspects related to health-care (nursing care, general practitioner appointments) or demographics (age, number of children) and others. Patients were willing to pay monthly for curative treatment €191.84 from an average monthly salary €470.84 (41%). Ovarian cancer diagnosis has a significant impact on HRQOL and WA and both are positively highly correlated. Ovarian cancer patients are willing to give significant share of their monthly salary for treatment leading to cure.

Key words: ovarian cancer, health-related quality of life (HRQOL), ability to work, willingness to pay

Ovarian cancer is the 7th most common cancer in women; with over 230,000 new patients diagnosed yearly worldwide [1]. It is associated with the highest mortality of all gynecological cancers in the developed world and is the fifth leading cause of all cancer-related deaths among women. Primary treatment is optimal debulking surgery, followed by chemotherapy. Despite the high initial responses, most patients experience relapse with diminishing effectiveness and an increase in the toxicity of subsequent treatments. Dominant symptoms of ovarian cancer patients are abdominal discomfort, pain, ascites or altered bowel movements. One important aspect is that the disease course involves radical surgery and intense courses of chemotherapy, i.e. health-related quality of life (HRQOL) is often compromised [2]. There is important evidence that an improvement in appetite, constipation and global health scores during the first 3 months of treat-

ment is significantly associated with improved survival time in ovarian cancer [3]. HRQOL in ovarian cancer patients was investigated in several studies [4–10]. Initial studies focused more on psychological symptoms. In ovarian cancer patients, depression was found in 21% and anxiety in 29% [4–6]. These were positively associated with performance status and features of HRQOL [11]. Further studies undertook a more complex evaluation of the quality of life (QoL), including psychological, physical and social domains [7–10]. A recent review of existing literature showed that ovarian cancer and its treatment have significant effects on QoL including fatigue and the physical and functional domains [12]. Reviewed studies indicate that ovarian cancer patients need a QoL change during the trajectory of the disease. Impact of disease duration and treatment on HRQOL together with patient-related outcomes (PROs) become regular feature of studies

on quality of life in oncology patients. The latest systematic review of 31 studies on HRQOL found that a majority of patients with ovarian cancer (OC) experience fatigue and depression, have more somatic and mental morbidity, and use the medication and health services more than healthy controls [13]. Interestingly, OC survivors tended to have stronger and positive relationships with significant others than healthy controls. A meta-analysis of 30 randomized EORTC trials, including two in ovarian cancer, on baseline quality of life revealed that HRQOL scales can provide prognostic information beyond clinical and sociodemographic variables [14]. Given the current economic climate, rising out-of-pocket expenses and drug pricing, we have also incorporated patients' ability to work and willingness to pay into our cross-sectional HRQOL study in OC patients.

Patients and methods

We have conducted a cross-sectional survey on HRQOL in the pilot and expanded population of a total of 123 ovarian cancer patients identified by treating oncologists as being able to complete the questionnaire either alone or with the assistance of oncology liaison nurses. General inclusion criteria were women aged 18 years and older, diagnosis of ovarian cancer, performance status permitting to complete all questions and signed informed consent. Both pilot and expanded cohort questionnaires were similar (Suppl data S1). The pilot cohort included additional questions from EORTC QoL-Ov28 (Suppl data S2) in the expanded cohort, queries regarding histology, treatment and stage went into more detail. Self-administered questionnaires were based on PRO and included demographics, cancer stage, awareness of the disease, comorbidities, and perceptions regarding the health care delivery, quality of life, ability to work, socioeconomic status as well as future expectations. Descriptive statistics, i.e. the mean and the standard deviation were calculated for quantitative data. We have used non-parametric Friedman and Dunne pairwise comparison tests to detect differences in HRQOL and the ability to work. Spearman correlation was used to measure the strength of association between variables [15]. A p -value <0.05 was considered as statistically significant. Data were analyzed using Statistica for Windows 5.0 (StatSoft Inc., Tulsa, OK, USA).

Results

General characteristics. A total of 123 OC patients completed the self-administered questionnaire. Mean age, weight and height were 59.7 years, 70.3 kg and 163 cm, respectively. Basic education completed 33 (26.8%) patients, middle school 72 (58.5%) and college/university 18 (14.7%) patients. Regarding marital status, 10 (8.2 %) patients were single, 75 married with 4 (64.2%) living in common household with a partner, 26 (21.1%) were widowed and 8 (6.5%) were divorced. Mean parity in our cohort was 2 children.

At this time 12 (9.8%) patients were smoking and regular alcohol use admitted 11 (8.9%) patients. Out of all respondents, 42 (34.1%) were currently employed, 3 (2.4%) were unemployed, and 60 (48.8%) were retired (social pensioners) plus 18 (14.7%) were disabled retirees (disability pensioners). Four patients from the whole cohort of 123 patients did not fill completely the QoL data and three patients did not fill completely the work ability (WA) data. This fact did not have any impact on final results in evaluation of the QoL and WA, so they were included in the whole evaluated sample.

Clinical characteristics and selected symptoms. Most patients were in stage III, metastatic disease was present in 17 patients (13.8%); commonly in liver, lungs and distant lymph nodes. Patients were diagnosed at mean 3.13 years before completing the survey, and with hindsight, patients identified first signs of the disease 3.6 months prior to the diagnosis. Each year, the patients spent on average 1.8 months as in-patients in hospital; they visited their oncologist on average 5.7 times, gynecologist 3.3 times, respiratory physician 1.7 times and GP 4.7 times. The most common comorbidities were hypertension (53–43.1%), diabetes (19–15.4%), back pain (13–10.6%), coronary heart disease (11–8.9%), rheumatologic disorders and others. Selected symptoms from QoL-Ov28 questionnaire were surveyed with mean values (1-no symptoms, 4-worst symptoms) for abdominal pain 1.45, bloating 1.53, fullness after meal 1.51, hair loss 2.46, upset by hair loss 2.2, tingling in hands or feet 2.19, weakness 2.5 and hot flushes 1.65.

Health care delivery, the impact of disease and future expectations. Patients were informed about their disease on average at 4.06 (1-worst, 5-best) with the most information having from the treating oncologist and from the internet. Satisfaction with a health care delivery by a physician was at 4.48 and by a nurse at 4.46 (1-worst, 5-best). Negative factors regarding health care delivery and use were the lack of psychological support (19 patients), appointment scheduling and waiting (15), financial expenditure (8) and others. When asked to self-rank on scale 1-pessimist to 5-optimist, patients were more optimistic, ranked on average at 3.58. Similarly, their future expectations were ranked at 3.79. The most optimistic outlook had family future (4.16), followed by health (3.59), finances (3.26) and future work (3.16).

Quality of life and work ability. The quality of life (1-worst, 10-best) of OC patients ranked at different time points in their life, currently at 6.98, at OC diagnosis 4.12, at the time without OC at 8.96 and at full health 9.53. Current work ability patients ranked at 6.22, at OC diagnosis 4.20, at the time without OC at 9.07 and at full health 9.58. The impact that OC treatment has on their QoL was ranked at 6.33, the impact of religion on QoL at 6.91 and the impact of OC diagnosis at QoL of their family at 6.11 (1-worst, 10-best).

Social and economic domains. Expenses for travel, drugs and physician visits dominated in spending for cancer diagnosis, compared to drugs and travel in other medical conditions. Monthly expenditure for ovarian cancer

(compared to all expenditures in other comorbidities, such as hypertension, diabetes or back pain), were more prominent; for drugs €63 vs €49, physician visits €28 vs €5, other tests €7 vs none, travel €77 vs €27, loss of the income €25 vs none, other expenses €15 vs €9. In total, monthly expenses for OC were doubled compared to other health conditions (€215 vs €90). On average, OC patients were on sick-leave for 36 days/year due to their cancer-related conditions, compared to 5.8 days for other illnesses (such as hypertension, diabetes or back pain). Patients were willing to pay monthly for curative treatment €191.84 from an average monthly salary €470.84 (41%).

Statistical comparisons for HRQOL. We have compared HRQOL at different time points in relation to OC diagnosis using nonparametric Friedman (Table 1) test with the subsequent Dunn’s (Table 2) pairwise comparison test. All comparisons were statistically significant with $p < 0.001$. Similar results were obtained for the work ability. Significant differences in the work ability were confirmed at different time points during the patient cancer journey. These were also significant when compared to one another using Dunne pairwise comparison (Table 3, Table 4). We have also used Spearman nonparametric correlation coefficient to test the relationship (correlation) of the selected factors with current HRQOL [15]. No correlation was detected with education (-0.02), faith (+0.04), stage of OC (-0.04), loss of income (+0.07). Small correlation was detected in nursing care (-0.15), parity (-0.18), GP visits (-0.18), physician care (-0.20), alcohol consumption (-0.24), disease duration (+0.28), age (-0.29) and personality (+0.29). Medium correlation, up to +0.51 was detected for oncologist visits (-0.38), information about the disease (+0.40), salary (+0.42), future expectations (+0.41) and quality of the family life (+0.51). The strongest correlation was detected in the impact of cancer treatment (+0.66) and a current work ability (+0.87).

Discussion

In our cross-sectional HRQOL study on OC patients and survivors, we have chosen selected questions from validated QLQ-Ov28 [16]. We use the words “work ability” which partially covered dimensions EQ 5D questionnaire “mobility, self-care and usual activities” [17]. In addition, we have relied on PROs as a useful assessment of patients’ treatment and interaction with healthcare. Baseline scores from this study are in line with HRQOL reports from other ovarian cancer patients, where significant emphasis from patients was given to the body image (hair loss) and the impact of a treatment (neuropathy, fatigue) [18, 19, 11]. Psychological factors were also emphasized in health care delivery questions, where the lack of psychological support was most commonly cited. Nonetheless, OC patients retained an optimistic attitude towards their and family future. These findings provide additional data to inform areas of priority for OC patients. OC patients from our cohort had spent on average almost 2

Table 1. Comparing HRQOL at different time points in OC patients’ journey.

HRQOL	n	\bar{x}	x_m	min	max	sd	p-value
Currently	119	6.98	8	0	10	2.41	<0.001
At OC diagnosis	119	4.19	4	0	10	2.43	
At time without OC	119	8.94	9	4	10	1.36	
At full health	119	9.52	10	5	10	0.85	

n – number of patients, \bar{x} – mean, x_m – median, sd – standard deviation, p – probability level of the Friedman test. Note: 4 patients from 123 patients did not fill completely the QoL data.

Table 2. Pairwise comparison of HRQOL at different time points in OC patients’ journey.

	Currently	At OC diagnosis	At time without OC	At full health
Currently	–	<0.001	<0.001	<0.001
At OC diagnosis	<0.001	–	<0.001	<0.001
At time without OC	<0.001	<0.001	–	<0.01
At full health	<0.001	<0.001	<0.01	–

Analysis using Dunn’s pairwise comparison test, the given values are Dunn’s test p-values.

Table 3. Comparing work ability at different time points in OC patients’ journey.

Work ability	n	\bar{x}	x_m	min	max	sd	p-value
Currently	120	6.22	7	0	10	3.13	<0.001
At OC diagnosis	120	4.20	4	0	10	2.65	
At time without OC	120	9.01	10	3	10	1.32	
At full health	120	9.58	10	5	10	0.09	

Three patients were excluded due to data incompleteness. n – number of patients, \bar{x} - mean, x_m - median, sd – standard deviation, p – probability level of the Friedman test. Note: 3 patients from 123 patients did not fill completely the WA data.

Table 4. Pairwise comparison of HRQOL at different time points in OC patients’ journey.

	Currently	At OC diagnosis	At time without OC	At full health
Currently	–	<0.001	<0.001	<0.001
At OC diagnosis	<0.001	–	<0.001	<0.001
At time without OC	<0.001	<0.001	–	<0.05
At full health	<0.001	<0.001	<0.05	–

Analysis using Dunn’s pairwise comparison test, the given values are Dunn’s test p-values.

months per year in a hospital. This extensive use of in-patient services might reflect the complication of cancer diagnosis, comorbidities as well as generally high hospital utilization in Central and Eastern Europe. From a recent EU report, Slovakia placed in the top ten countries with almost 200 hospital discharges per 1,000 inhabitants [20]. Across EU countries, the main conditions leading to hospitalizations were cardio-

vascular, digestive and obstetric conditions as well as cancer. Ovarian cancer diagnosis has a significant impact on QoL and work ability at the time of diagnosis and with successful treatment is this negative impact only partially reversed [18, 19, 8]. This is underlined by the fact that only 15% of ovarian cancer cases were diagnosed at an early stage and in general, the 5-year survival rate was only 46% [21]. The clinical state had an impact on mobility impairment and is associated with medical comorbidities, abdominal bloating, fatigue, lack of appetite, numbness/tingling, and pain [22]. The other impact is on disability to work, and this could be expressed as DALY (disability adjusted life years). Ovarian cancer was on the fourth place of malignant diseases in females in relationship to DALY-s, behind the breast, cervical, and lung cancer [23]. This highlights the fact that OC survivors may benefit from additional resources and interventions, beyond that provided by a treating oncologist. The strongest positive correlation to HRQOL in OC patients was with the work ability, the impact of cancer treatment, future expectations, QoL of family, salary and information about the disease. It is clear that patients value not only productive working and earnings but also care about the burden on their family and future prospects. A systematic review of randomized trials of HRQOL in OC patients found that survivors tended to have a more positive relationship with their partners compared to controls [24]. Moreover, the family costs associated with informal caregiving to ovarian cancer patients in Italy from diagnosis up to the end of first line chemotherapy have been estimated at €10,981 annually [25]. In our study, we have found more pronounced spending for OC diagnosis (€215) compared to other health issues (€90). Ovarian cancer patients were prepared to spend 41% of their monthly salary for curative treatment. As significant out-of-pocket expenses are required for OC patients, it is important to note that lower financial status was associated with deteriorating of QoL in Chinese OC patients [19]. To the best of our knowledge, this is the first study in OC patients from Central and Eastern Europe assessing factors associated with HRQOL, including the ability to work and willingness to pay. There are several limitations to our study. First, it was a cross-sectional study with a relatively small number of participants. However, patients were recruited from several oncology practices across the country. This was a pilot study, our sample represents about 4 to 5 % of ovarian cancer prevalence in Slovakia with similar average stage [26, 27]. The aim of this study was to identify general trends and statistically significant correlations should be interpreted in this context. Secondly, a mixed population of OC patients with different histologies and stages was included. Yet, this population represents the true OC population in oncology out-patient departments. We are also conscious of the limitations by administering the investigator-derived questionnaire. Nonetheless, additional needs of patients were captured by using the patient reported outcomes. This study reveals significant differences between HRQOL and the ability to work in ovarian cancer survivors.

Our findings suggest that HRQOL was significantly different at various points during the cancer journey; between the current state and at the diagnosis and at the time without cancer or at the time in full health. Similarly, significant differences were noted in the patients' work ability. The highest correlation of HRQOL was found in relation to the current ability to work and in the impact of cancer treatment. These domains should be the priority areas for future studies and interventions.

Supplementary information is available in the online version of the paper.

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References

- [1] FERLAY J, SOERJOMATARAM I, ERVIK M, DIKSHIT R, ESER S et al (Eds.). GLOBOCAN 2012. Estimated Cancer Incidence, Mortality and Prevalence Worldwide in 2012 v1.0. IARC CancerBase No. 11. ISBN 978-92-832-2447-1. [<http://globocan.iarc.fr>]
- [2] CHASE DM, WENZEL L. Health-related quality of life in ovarian cancer patients and its impact on clinical management. *Expert Rev Pharmacoecon Outcomes Res* 2011; 11: 421–431. <https://doi.org/10.1586/erp.11.41>
- [3] GUPTA D, BRAUN DP, STAREN ED, MARKMAN M. Longitudinal health-related quality of life assessment: implications for prognosis in ovarian cancer. *J Ovarian Res* 2013; 6: 17. <https://doi.org/10.1186/1757-2215-6-17>
- [4] FERRELL B, SMITH SL, CULLINANE CA, MELANCON C. Psychological well being and quality of life in ovarian cancer survivors. *Cancer* 2003; 98: 1061–1071. <https://doi.org/10.1002/cncr.11291>
- [5] NORTON TR, MANNE SL, RUBIN S, CARLSON J, HERNANDEZ E et al. Prevalence and predictors of psychological distress among women with ovarian cancer. *J Clin Oncol* 2004; 22: 919–926. <https://doi.org/10.1200/JCO.2004.07.028>
- [6] STEWART DE, WONG F, DUFF S, MELANCON CH, CHEUNG AM. "What doesn't kill you makes you stronger": an ovarian cancer survivor survey. *Gynecol Oncol* 2001; 83: 537–542. <https://doi.org/10.1006/gyno.2001.6437>
- [7] TENG FF, KALLOGER SE, BROTTTO L, MCALPINE JN. Determinants of quality of life in ovarian cancer survivors: a pilot study. *J Obstet Gynaecol Can* 2014; 36: 708–715. [https://doi.org/10.1016/S1701-2163\(15\)30513-2](https://doi.org/10.1016/S1701-2163(15)30513-2)
- [8] GREIMEL E, DAGHOFER F, PETRU E. Prospective assessment of quality of life in long-term ovarian cancer survivors. *Int J Cancer* 2011; 128: 3005–3011. <https://doi.org/10.1002/ijc.25642>
- [9] MIRABEAU-BEALE KL, KORNBLITH AB, PENSON RT, LEE H, GOODMAN A et al. Comparison of the quality of life of early and advanced stage ovarian cancer survivors. *Gynecol Oncol* 2009; 114: 353–359. <https://doi.org/10.1016/j.ygyno.2009.05.009>

- [10] KORNBLITH AB, MIRABEAU-BEALE K, LEE H, GOODMAN AK, PENSON RT et al. Long-term adjustment of survivors of ovarian cancer treated for advanced-stage disease. *J Psychosoc Oncol* 2010; 28: 451–469. <https://doi.org/10.1080/07347332.2010.498458>
- [11] BODURKA-BEVERS D, BASEN-ENGQUIST K, CARMACK CL, FITZGERALD MA, WOLF JK et al. Depression, anxiety, and quality of life in patients with epithelial ovarian cancer. *Gynecol Oncol* 2000; 78: 302–308. <https://doi.org/10.1006/gyno.2000.5908>
- [12] ARRIBA LN, FADER AN, FRASURE HE, VON GRUENIGEN VE. A review of issues surrounding quality of life among women with ovarian cancer. *Gynecol Oncol* 2010; 119: 390–396. <https://doi.org/10.1016/j.ygyno.2010.05.014>
- [13] AHMED-LECHEHEB D, JOLY F. Ovarian cancer survivors' quality of life: a systematic review. *J Cancer Surviv* 2016; 10: 789–801. <https://doi.org/10.1007/s11764-016-0525-8>
- [14] QUINTEN C, COENS C, MAUER M, COMTE S, SPRANGERS MA et al. Baseline quality of life as a prognostic indicator of survival: a meta-analysis of individual patient data from EORTC clinical trials. *Lancet Oncol* 2009; 10: 865–871. [https://doi.org/10.1016/S1470-2045\(09\)70200-1](https://doi.org/10.1016/S1470-2045(09)70200-1)
- [15] SNEDECOR GW, COCHRAN WG (Eds.). *Statistical Methods*, 8th Edition. Iowa State University Press, 1989, p. 503. ISBN: 978-0813815619.
- [16] CULL A, HOWAT S, GREIMEL E, WALDENSTROM AC, ARRARAS J et al. Development of a European Organization for Research and Treatment of Cancer questionnaire module to assess the quality of life of ovarian cancer patients in clinical trials: a progress report. *Eur J Cancer* 2001; 37: 47–53. [https://doi.org/10.1016/s0959-8049\(00\)00369-5](https://doi.org/10.1016/s0959-8049(00)00369-5)
- [17] EUROQOL GROUP. EuroQol – a new facility for the measurement of health-related quality of life. *Health Policy* 1990; 16: 199–208. [https://doi.org/10.1016/0168-8510\(90\)90421-9](https://doi.org/10.1016/0168-8510(90)90421-9)
- [18] MERANER V, GAMPER EM, GRAHMANN A, GIESINGER JM, WIESBAUER P et al. Monitoring physical and psychosocial symptom trajectories in ovarian cancer patients receiving chemotherapy. *BMC Cancer* 2012, 12: 77. <https://doi.org/10.1186/1471-2407-12-77>
- [19] STAVRAKA C, FORD A, GHAEM-MAGHAMI S, CROOK T, AGARWAL R et al. A study of symptoms described by ovarian cancer survivors. *Gynecol Oncol* 2012; 125: 59–64. <https://doi.org/10.1016/j.ygyno.2011.12.421>
- [20] OECD, EU. *Health at a Glance: Europe 2018. State of Health in the EU Cycle*. OECD Publishing, Paris, EU, Brussels 2010. https://doi.org/10.1787/health_glance_eur-2018-en
- [21] AMERICAN CANCER SOCIETY. *Cancer Facts & Figures 2010*. American Cancer Society, Atlanta 2010, No 500810, p 68.
- [22] CAMPBELL G, HAGAN T, GILBERTSON-WHITE S, HOUZE M, DONOVAN H. Cancer and treatment-related symptoms are associated with mobility disability in women with ovarian cancer: A cross-sectional study. *Gynecol Oncol* 2016; 143: 578–583. <https://doi.org/10.1016/j.ygyno.2016.09.013>
- [23] AIHW. *Burden of Cancer in Australia: Australian Burden of Disease Study 2011*. Australian Institute of Health and Welfare, Canberra 2017, Cat. no. BOD 13, p. 135.
- [24] ANGIOLI R, CAPRIGLIONE S, ALOISI A, MIRANDA A, DE CICCIO NARDONE C et al. Economic Impact Among Family Caregivers of Patients With Advanced Ovarian Cancer. *Int J Gynecol Cancer* 2015; 25: 1541–1546. <https://doi.org/10.1097/IGC.0000000000000512>
- [25] SHAO Z, ZHU T, ZHANG P, WEN Q, LI D, WANG S: Association of financial status and the quality of life in Chinese women with recurrent ovarian cancer. *Health Qual Life Outcomes* 2017; 15: 144. <https://doi.org/10.1186/s12955-017-0714-9>
- [26] ONDRUSOVA M, SADOVSKY O, PSENKOVA M. [Epidemiology of selected gynaecological malignancies in Slovakia.] *Onkologia (Bratisl.)* 2015; 10: 223–225.
- [27] HLODAKOVA V, DIBA CS (Eds.). *Cancer incidence in the Slovak Republic 2011*. National Health Information Center, NOR, Bratislava 2018, p. 198. ISBN 978-80-89292-64-6.