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Effect of chronic comorbidities on quality of life of gynecologic cancer patients in Puerto Rico

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ABSTRACT

Objective. To describe prevalence of chronic diseases and evaluate associations between comorbidities and quality of life in gynecologic cancer patients in Puerto Rico.

Methods. A cross-sectional study among 233 women aged ≥21 years with a gynecologic cancer diagnosis. Through telephone interviews, information on comorbidities, quality of life, and other covariates were assessed. Quality of life included six items, assessing physical and mental health. Multivariate logistic regression models were used to estimate magnitude of association between the comorbidities under study (diabetes, cardiovascular and autoimmune diseases) and quality-of-life items, through adjusted prevalence odds ratio (aPOR; 95% confidence interval [CI]).

Results. Most women (90.1%) reported one or more comorbidities in addition to their cancer diagnosis; cardiovascular diseases (63.1%) were more common than autoimmune diseases (37.3%) and diabetes (33.9%). Between 30% and 40% of the sample indicated dysfunctions in their general health (39.5%) and frequent physical (33.9%) and mental distress (31.8%). Adjusting for age and gross family income, women with autoimmune diseases presented higher prevalence of frequent limitations for daily activities (aPOR 2.00; 95% CI 1.05–3.81), poor general health (aPOR 3.52; 95% CI 1.90–6.49), frequent mental distress (aPOR 2.19; 95% CI 1.19–4.03), and dissatisfaction with life (aPOR 4.86; 95% CI 1.82–12.95) compared to those who did not report autoimmune diseases. No associations with cardiovascular diseases and diabetes were observed.

Conclusions. Quality-of-life dysfunctions were highly prevalent in this population of gynecologic cancer patients. Suffering from autoimmune comorbidities significantly exacerbated those dysfunctions.

Keywords Quality of life; genital neoplasms, female; cardiovascular diseases; diabetes mellitus; autoimmune diseases; Puerto Rico.

A gynecologic cancer is any cancer originated inside the reproductive organs of women and is identified according to the part in which it arises: fallopian tube, cervix, ovary, uterus, vagina, and vulva (1). Each type of gynecologic cancer is different and requires different prevention and treatment strategies (1). In Latin America and the Caribbean, Bolivia, Paraguay, and Cuba had the highest age-standardized incidence rates of gynecologic cancer in 2020, with 86.2, 80.2, and 67.6 cases per 100 000 women, respectively (2). When estimating prevalence of these cancers for the same year, Cuba had the highest prevalence, with 68.1 per 100 000 population, followed by Puerto Rico (PR) (55.0) and Bolivia (54.8) (2). It is estimated that there will be 180 062 new cases of gynecologic cancer in the region by 2040, a 49.5% increase over current numbers (2). This is concerning, as it highlights the public health relevance of these malignancies in Latin America, and considering the limited human resources and access to health services in lower-income countries in the region (3). The latest report available from PR indicated that 1 219 cases of gynecologic cancer were diagnosed in 2016, representing 15.8% of the total

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incidence of cancer in women (4). In addition, 309 deaths from gynecologic cancers were certified, representing 13.3% of cancer mortality in women (4). Uterine cancer was the most common gynecologic malignancy diagnosed in 2016 (58.0%), followed by cervical cancer (18.5%), ovarian cancer (15.3%), and vaginal and vulvar cancers (6.6%) (4).

Chronic diseases are also a major public health concern in Latin America. Cardiovascular diseases (CVDs) are the main cause of death in the region (5), while more than 80% of deaths in the world from CVDs occur in Latin American countries (5). Diabetes has also become a global health challenge (6). In 2019, it was estimated that 31.6 million persons were living with diabetes in Latin America, which is predicted to increase to 40.2 million by 2030 (6). On the other hand, nearly 4% of the world's population is affected by one of more than 80 different autoimmune diseases, and the prevalence of autoimmune diseases is increasing (7). Population aging, urbanization, changes in lifestyle, and limited access to health services are the main causes of the increasing importance of CVDs, diabetes, and other chronic diseases (5–7). Because of their systemic impact, these diseases have been associated with both acute and long-term complications that affect health care needs, costs, well-being, and productivity (5–7).

Cancer, diabetes, and cardiovascular and autoimmune diseases are also the main causes of morbidity, mortality, and disability in PR (8). Aging women of low socioeconomic status have higher rates of morbidity, mortality, and disability due to chronic diseases compared with the rest of the Puerto Rican population (8), having a great impact on their quality of life (QoL). QoL implies the *perception* of the individual about their position in life within the cultural context and value system in which they live, their goals, expectations, and concerns (9). It is a multidimensional and complex concept that includes aspects such as health, independence, satisfaction with life, support networks, and social services, of vital importance as part of the functional, affective, and social structure (9).

QoL measures are intended to permit the assessment of patients' perspectives on the impact of health and health care interventions on their lives, and to allow that these perspectives are considered in clinical decision-making and research (10). Cancer and its treatment can significantly alter QoL. Mobility, psyche, and economic status are often affected, impairing well-being and hindering the performance of daily activities (11). Body pain is a common symptom for cancer patients, which is interpreted as a sign of worsening of the disease and affects their emotional state (11). Cancer is also a stressor, associated with death or disability, which can lead to symptoms of depression (11). Biologically, cancer affects the immune system, obstructing the production of "happiness hormones" such as serotonin, and can cause dysfunctions in physical and mental QoL (11).

A cancer diagnosis alone, as disease or as stressor, is a determining factor in patients' QoL. However, the presence of comorbidities can greatly aggravate the health status of patients and their perception of themselves. Comorbidity means that more than one disease or condition is present in the same person at the same time (12). Comorbidities are often chronic conditions (12), such as cardiovascular diseases, diabetes, and autoimmune diseases. Studies on breast cancer indicate that comorbidities such as hypertension, arthritis, and diabetes are associated with dysfunctions in the QoL of patients and survivors (13). Comorbidities have also been associated with other dysfunctions in QoL of patients with prostatic cancer, such as negative effects on their mental state and hormonal and sexual function (14).

As women are family leaders and caregivers, their health status has an impact on the well-being of their families and on the economic development of their communities (15). Literature is limited on the effect that comorbidities can have on the QoL of patients with gynecologic cancer and/or other types of cancer, especially from Latin American and Caribbean countries. This research aimed (a) to describe the prevalence of chronic diseases and dysfunctions in aspects of QoL among a sample of patients with gynecologic cancer in PR, and (b) to evaluate the magnitude of the effect of chronic comorbidities on the QoL of these patients. Given the high burden of gynecologic malignancies among women, this information will be important for the design of public health and clinical interventions focused on improving the QoL of female cancer patients in the future.

MATERIALS AND METHODS

This cross-sectional study analyzed data collected by the research "Impact of Hurricane-Related Stressors and Responses on Cancer Care and Health Outcomes of Women with Gynecologic Cancers from Puerto Rico and the Virgin Islands" (16), funded by the National Institute of Health (NIH Grant: 1R21CA239457-01). In the parent study, a telephone-based interview was used to assess demographic, clinical, and lifestyle variables among women aged ≥21 years with a diagnosis of gynecologic cancer (16). Telephone-based interviews have been used in several studies, due to high reliability, compliance rate, and convenience for the investigator and the participants (17, 18). Telephones give researchers access to varied resources and experiences without the need to endure the expenses and time consumed by traveling to different areas (17). It is possible to interview individuals who may not otherwise be available due to their location and minimizes interviewer bias (17). Also, part of the interview process took place during the COVID-19 pandemic, making it an ideal method for continuing the investigation (16).

Data were entered in REDCap (Research Electronic Data Capture) by trained interviewers (16). Comorbidities evaluated were diabetes (types I and II), cardiovascular disease (hypertension and heart disease), and autoimmune diseases (lupus, HIV, rheumatoid arthritis, and Crohn's disease), assessed through self-report of study participants.

The six QoL questions were available in the study questionnaire and previously used by the Behavioral Risk Factor Surveillance Survey (16, 19). QoL was divided in and assessed by two domains: physical and mental. The physical domain was subdivided into: frequent limitations when performing daily activities (FAL); poor general health (PGH); and frequent physical distress (FPD). The mental domain was subdivided into: rare or no social-emotional support (RNSES); dissatisfaction with life (DL); and frequent mental distress (FMD) (16, 19).

As part of the physical domain, the questionnaire contained one question regarding general health: "Would you say that in general your health is excellent, very good, good, fair, or poor?" Responses were dichotomized into (1) excellent, very good, or good, versus (2) fair or poor. Respondents reporting fair or poor health were identified with PGH. The physically unhealthy days question was assessed by: "Now thinking about your

physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?'' Reports of 14 or more days were identified with FPD. A similar question was asked for activity limitations: ''During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?'' Respondents reporting 14 or more days were identified with FAL (16, 19).

For the mental domain, mentally unhealthy days were assessed by: ''Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?'' Respondents reporting 14 days or more were identified with FMD. Social and emotional support was assessed by: ''How often do you get the social and emotional support you need?'' Responses were dichotomized into (1) always, usually, or sometimes, versus (2) rarely or never. Respondents reporting rarely or never were identified with RNSES. Life satisfaction was assessed by: ''In general, how satisfied are you with your life?'' Responses were dichotomized into (1) very satisfied or satisfied, versus (2) dissatisfied or very dissatisfied. Respondents who were dissatisfied or very dissatisfied with their lives were identified with DL (16, 19).

Participants of the parent study were 272 women aged ≥21 years diagnosed with gynecologic cancer between September 2016 and September 2018 and who received services in gynecologic oncology clinics in PR. In addition, they were residents of PR who experienced hurricanes Irma and Maria in PR and were living in the island by the time of the interview (16). These women were a random sample of patients who received services in five gynecologic oncology clinics in PR. From the participants recruited into the parent study, patients were eligible for this sub-study if they had fully answered the questions about comorbidities (independent variable) and QoL in any of its domains (dependent variables). If at least one of those questions was not answered, the patient was excluded from the analysis. Thus, the final sample size for this sub-study consisted of 233 (85.7%) gynecologic cancer patients.

Statistical analysis was performed with STATA Version 13. Using the database provided for this study, a descriptive analysis of the sample was performed (sociodemographic, clinical, and QoL variables) (20). Pearson's Chi-square test was used to explore the relationships between each of the comorbidities under study, as well as sociodemographic and clinical variables, and each individual QoL item. Multivariate logistic regressions were performed to explore crude and covariate-adjusted associations between each of the comorbidities under study and QoL items. These measures are presented in terms of the adjusted prevalence odds ratio (aPOR) with their respective 95% confidence intervals (95% CI). POR is a measure of exposure–event association, which represents the prevalence of the probability of an event occurring given a particular exposure compared to the prevalence of probabilities of the event occurring in the absence of that exposure, used in cross-sectional studies (21). Exposure was defined as the presence of the comorbidities under study, and the event was defined as the negative effect on the components of QoL. Covariates used in the adjusted models included age and reported annual gross family income. Significance was reached with an alpha <0.05. This protocol was approved by the Institutional Review Board of the University of Puerto Rico, Medical Sciences Campus, on 10 March 2021 (IRB Protocol Number: A1810320).

RESULTS

The median age of gynecologic cancer patients who participated in this study was 58 years. Most of the women had a level of education greater than a high-school diploma (69.5%) and were employed (33.1%). Only 40.3% of women reported a gross family income of US$ 20 000 or more. Uterine cancer was the most prevalent (56.7%), followed by ovarian cancer (18.5%) and cervical cancer (17.6%) (Table 1).

Overall, 90.1% of the participants reported one or more comorbidities in addition to their diagnosis of gynecologic cancer. The most frequent comorbidities reported were CVDs (63.1%), followed by autoimmune diseases (37.3%) and diabetes (33.9%). Regarding the physical QoL domain, 33.9% reported FPD, 24.5% reported having FAL, and 39.5% reported the perception of having PGH in the 30 days prior the interview. When evaluating the mental QoL, 31.8% indicated FMD, 20.2% reported RNSES, and 10.7% indicated DL in the 30 days before the interview (Table 1).

TABLE 1. Sociodemographic, clinical, and quality-of-life descriptive variables of gynecological cancer patients diagnosed from September 2016 to September 2018, Puerto Rico (N = 233)

Variables		n	%
Age (years)	21–49	54	23.18
	50–64	107	45.92
	≥65	72	30.90
Education	≤ High-school diploma	71	30.47
	> High-school diploma	162	69.53
Employment status	Employed	77	33.05
	Retired	64	27.47
	Unemployed	61	26.18
	Unable to work	31	13.30
Annual gross family income (US$)	<$10 000	82	35.19
	$10 000–$19 999	57	24.47
	≥$20 000	94	40.34
Gynecologic cancer type	Cervix uteri	41	17.60
	Corpus uteri	132	56.65
	Ovary	43	18.45
	Other [b]	17	7.30
Presence of comorbidities [a]	Cardiovascular	147	63.09
	Diabetes	79	33.91
	Autoimmune	87	37.34
	Other [c]	168	72.10
Total of comorbidities per patient	0 (cancer only)	23	9.87
	1 (cancer + 1 disease)	54	23.18
	2 (cancer + 2 diseases)	71	30.47
	3 (cancer + 3 diseases)	55	23.61
	4 (cancer + 4 diseases)	30	12.88
Physical quality of life	Frequent physical distress	79	33.91
	Frequent activity limitations	57	24.46
	Poor general health	92	39.48
Mental quality of life	Frequent mental distress	74	31.76
	Rare or no social-emotional support	47	20.17
	Dissatisfaction with life	25	10.73

Notes:
[a] Percentages shown are from the entire population (N = 233).
[b] Other: vulvar, vaginal, unspecified.
[c] Other: hemorrhoids, periodontal disease, and additional specified.
Source: Prepared by the authors from the results of this study.

When performing the bivariate analysis (Pearson's Chi-square), between the sociodemographic and physical QoL variables, age was significantly associated ($p = 0.024$) with the report of ≥14 days with FPD in the 30 days prior to the interview. Women ≥65 years had higher prevalence of FPD (38.9%) compared with other age groups. Level of education was significantly associated ($p = 0.018$) with the report of RNSES in the 30 days prior to the interview. Women with a level of education less than or equal to a high-school diploma had higher prevalence of RNSES (29.6%) compared to those women with higher level of education (16.1%). Employment status was significantly associated with the report of FPD ($p = 0.002$) and PGH ($p = 0.006$) in the 30 days prior to the interview. Women unable to work reported higher prevalence of FPD and PGH (58.1% and 61.3%, respectively) compared to women under other employment categories. Annual gross family income was significantly associated ($p = 0.021$) with the report of FPD in the 30 days prior the interview. Women who reported receiving a gross income of less than US$ 10 000 had higher prevalence of FPD (45.1%) compared to the higher income ranges. When analyzing differences in QoL items by cancer type, no significant associations were observed (Table 2). Biological and lifestyle variables, such as obesity and smoking patterns, were evaluated for potential confounding, but results were not statistically significant.

A comparison of the QoL indicators was made between women with no comorbidities versus those who reported at least one comorbidity (Table 3). However, no differences were observed ($p \geq 0.05$) (Table 3). When evaluating specific groups of comorbidities, having diabetes was significantly associated with the report of FPD in the 30 days prior to the interview; women with diabetes had higher prevalence of FPD compared to women without the disease (43.0%; $p = 0.035$). Autoimmune diseases were significantly associated ($p < 0.05$) with the report of FAL, PGH, FMD, and DL, with higher prevalence among those with the disease compared to those who did not report autoimmune diseases. Associations between CVDs or "other diseases" and the components of QoL were not observed ($p \geq 0.05$) (Table 3).

Results from logistic regression models showed that, when adjusting for age and annual gross family income, gynecologic cancer patients who also suffer from autoimmune diseases had 2–5 times the possibility of reporting FAL (aPOR 2.00; 95% CI 1.05–3.81), PGH (aPOR 3.52; 95% CI 1.90–6.49), FMD (aPOR 2.19; 95% CI 1.19–4.03), and DL (aPOR 4.86; 95% CI 1.82–12.95), compared to gynecologic cancer patients who do not suffer from autoimmune diseases (Table 4). Statistically significant associations between other specific diseases and the components of QoL were not observed ($p \geq 0.05$).

DISCUSSION

To our knowledge, this is the first study to describe QoL and assess the association of comorbidity indicators of physical and mental QoL in a population of women with gynecologic cancer in PR. Cancer patients and survivors face physical, emotional, psychosocial, spiritual, and financial challenges due to diagnosis and treatment (22). This sample of gynecological cancer patients presented high prevalence of physical and mental QoL dysfunctions. Perceptions of PGH, FPD, and FMD were the most prevalent among these women. These estimates are higher than those for the general female population of PR, particularly for FPD and FMD (23). According to the BRFSS 2019, the prevalence of perception of PGH, FPD, and FMD for the general population of Puerto Rican women were 36.8%, 21.5%, and 12.2%, respectively (23). All physical health problems have psychological dimensions, particularly when they involve learning to live with long-term conditions accompanied by significant functional impairment, economic disenfranchisement, and social isolation (22). When all these aspects converge in a cancer patient, the effects on their QoL can be overwhelming, which is why QoL is an essential element in U.S. Cancer Control Plans (22). According to Puerto Rico's Cancer Control Plan, all patients who complete cancer treatments should be provided with a cancer care summary and follow-up as standard of care (24). This will ensure adequate management of treatment side effects and prevent cancer recurrences and new cancers, as well as to increase survival and QoL after cancer treatment (24).

Despite the high prevalence of QoL dysfunctions, having no comorbidities or an increased number of comorbidities was not significantly associated with the QoL indicators. Cancer may be sufficient to cause dysfunctions in these QoL components. Nayak and colleagues showed that 82.3% of cancer patients in India reported QoL dysfunctions, influenced by reported symptoms related to their cancer diagnosis (25). Very low level of QoL was observed in this study, with high prevalence of dysfunctions reported for general (96.1%), physical (72.3%), and psychological well-being (53.5%) (25).

However, when evaluating groups of comorbidities, suffering from autoimmune diseases significantly exacerbated these dysfunctions. Several reports concurred that cancer management and survival decreases significantly in patients with autoimmune or chronic inflammatory diseases, being largely associated with a higher risk of developing immune-related adverse events in response to anticancer therapy (26, 27). Autoimmune diseases cause a variety of side effects, which can mirror or double those experienced by cancer patients, due to the disease itself or treatments like chemotherapy or immunotherapy (27). Gynecologic cancer patients who also reported autoimmune diseases were more likely to experience FAL, PGH, FMD, and DL compared with those gynecologic cancer patients that did not have autoimmune diseases.

Participants who reported diabetes were more likely to experience FPD compared with non-diabetic gynecologic cancer patients. Tang and colleagues presented that diabetes (types I and II) significantly reduced QoL, and that the effect of diabetes on QoL is independent of tumor size and stage index (28). Diabetic cancer patients also reported higher frequency of physical symptoms (28).

The findings in this investigation offer contributions to oncology and public health knowledge. These data provide a basis for effective decision-making by government, health, and non-profit entities for a better management of resources and services that are aimed at improving the QoL of these patients. All sectors need to consider the physical components but also the emotional and social components of health for more effective interventions.

Assessment of QoL among cancer patients is imperative, as a patient's mood and self-perception can negatively affect the results of treatment (29–31). Researchers have suggested that cancer patients with higher levels of positivity and support tend to follow medical treatment and report fewer negative symptoms and use of coping strategies against the challenges of illness (29–31). Patients with gynecologic malignancies,

TABLE 2. Sociodemographic and clinical variables by impaired quality-of-life status among gynecologic cancer patients diagnosed from September 2016 to September 2018, Puerto Rico (N = 233)

Variables		Physical domain						Mental domain					
		FPD		FAL		PGH		FMD		RNSES		DL	
		n (%)	*p*-value	n (%)	*p*-value	n (%)	*p*-value	n (%)	*p*-value	n (%)	*p*-value	n (%)	*p*-value
Age (years)	21–49	10 (18.52)	**0.024**	9 (16.67)	≥0.05	18 (33.33)	≥0.05	15 (27.78)	≥0.05	14 (25.93)	≥0.05	6 (11.11)	≥0.05
	50–64	41 (38.32)		29 (27.10)		47 (43.93)		37 (34.58)		23 (21.50)		9 (8.41)	
	≥65	28 (38.89)		19 (50.88)		27 (37.50)		22 (30.56)		10 (13.89)		10 (13.89)	
Education	≤ High-school diploma	30 (42.25)	≥0.05	15 (21.13)	≥0.05	31 (43.66)	≥0.05	21 (29.58)	≥0.05	21 (29.58)	**0.018**	9 (12.68)	≥0.05
	> High-school diploma	49 (30.25)		42 (25.93)		61 (37.65)		53 (32.72)		26 (16.05)		16 (9.88)	
Employment status	Employed	16 (20.78)	**0.002**	15 (19.48)	≥0.05	20 (25.97)	**0.006**	24 (31.17)	≥0.05	17 (22.08)	≥0.05	5 (6.49)	≥0.05
	Retired	21 (32.81)		14 (21.88)		28 (43.75)		18 (28.13)		16 (25.00)		6 (9.38)	
	Unemployed	24 (39.34)		20 (32.79)		25 (40.98)		22 (36.07)		10 (16.39)		9 (14.75)	
	Unable to work	18 (58.06)		8 (25.81)		19 (61.29)		10 (32.26)		4 (12.90)		5 (16.13)	
Annual gross family income (US$)	<$10 000	37 (45.12)	**0.021**	20 (24.39)	≥0.05	40 (48.78)	≥0.05	24 (29.27)	≥0.05	22 (26.83)	≥0.05	12 (14.63)	≥0.05
	$10 000–$19 999	18 (31.58)		14 (24.56)		23 (40.35)		17 (29.82)		11 (19.30)		6 (10.53)	
	≥$20 000	24 (25.53)		23 (24.47)		29 (30.85)		33 (35.11)		14 (14.89)		7 (7.45)	
Gynecologic cancer type	Cervix uteri	12 (29.27)	≥0.05	11 (26.83)	≥0.05	18 (43.90)	≥0.05	15 (36.59)	≥0.05	10 (24.39)	≥0.05	5 (12.20)	≥0.05
	Corpus uteri	43 (32.58)		25 (18.94)		47 (35.61)		36 (27.27)		24 (18.18)		14 (10.61)	
	Ovary	16 (37.21)		16 (37.21)		17 (39.53)		15 (34.88)		10 (23.26)		3 (6.98)	
	Other [a]	8 (47.06)		5 (29.41)		10 (58.82)		8 (47.06)		3 (17.65)		3 (17.65)	

Notes:
Abbreviations: FPD, frequent physical distress; FAL, frequent activity limitations; PGH, poor general health; FMD, frequent mental distress; RNSES, rare/no social-emotional support; DL, dissatisfaction with life.
p-values in bold font, Pearson Chi-square test $p \leq 0.05$.
[a] Other: vulvar, vaginal, unspecified.
Source: Prepared by the authors from the results of this study.

TABLE 3. Comorbidities by impaired quality-of-life status among gynecologic cancer patients diagnosed from September 2016 to September 2018, Puerto Rico (N = 233)

Variables		Physical domain						Mental domain					
		FPD		FAL		PGH		FMD		RNSES		DL	
		n (%)	*p*-value	n (%)	*p*-value	n (%)	*p*-value	n (%)	*p*-value	n (%)	*p*-value	n (%)	*p*-value
Presence of comorbidities													
	None	10 (43.48)	≥0.05	8 (34.78)	≥0.05	7 (30.43)	≥0.05	8 (34.78)	≥0.05	5 (21.74)	≥0.05	2 (8.70)	≥0.05
	≥1	69 (32.86)		49 (23.33)		85 (40.48)		66 (31.43)		42 (20.00)		23 (10.95)	
Comorbidities													
Cardiovascular	–	26 (30.23)	≥0.05	19 (22.09)	≥0.05	30 (34.88)	≥0.05	23 (26.74)	≥0.05	20 (23.26)	≥0.05	5 (5.81)	≥0.05
	+	53 (36.05)		38 (25.85)		62 (42.18)		51 (34.69)		27 (18.37)		20 (13.61)	
Diabetes	–	45 (29.22)	**0.035**	42 (27.27)	≥0.05	59 (38.31)	≥0.05	48 (31.17)	≥0.05	35 (22.73)	≥0.05	14 (9.09)	≥0.05
	+	34 (43.04)		15 (18.99)		33 (41.77)		26 (32.91)		12 (15.19)		11 (13.92)	
Autoimmune	–	44 (30.14)	≥0.05	28 (19.18)	**0.015**	43 (29.45)	**<0.001**	38 (26.03)	**0.015**	29 (19.86)	≥0.05	8 (5.48)	**0.001**
	+	35 (40.23)		29 (33.33)		49 (56.32)		36 (41.38)		18 (20.69)		17 (19.54)	
Other [a]	–	20 (30.77)	≥0.05	18 (27.69)	≥0.05	24 (36.92)	≥0.05	23 (35.38)	≥0.05	14 (21.54)	≥0.05	7 (10.77)	≥0.05
	+	59 (35.12)		39 (23.21)		68 (40.48)		51 (30.36)		33 (19.64)		18 (10.71)	

Notes:
Abbreviations: FPD, frequent physical distress; FAL, frequent activity limitations; PGH, poor general health; FMD, frequent mental distress; RNSES, rare/no social-emotional support; DL, dissatisfaction with life.
p-values in bold font, Pearson Chi-square test $p \leq 0.05$.
[a] Other: hemorrhoids. periodontal disease, and additional specified.
Source: Prepared by the authors from the results of this study.

TABLE 4. Adjusted[a] prevalence odds ratio (aPOR) of dysfunctions in quality-of-life domains based on comorbidities among gynecologic cancer patients diagnosed from September 2016 to September 2018, Puerto Rico (N = 233)

Variables	Physical domain			Mental domain		
	FPD	FAL	PGH	FMD	RNSES	DL
	aPOR (95% CI)	aPOR (95% CI)	aPOR (95% CI)	aPOR (95% CI)	aPOR (95% CI)	aPOR (95% CI)
Comorbidities						
Cardiovascular	0.95 (0.50–1.80)	1.11 (0.56–2.20)	1.26 (0.69–2.31)	1.60 (0.85–3.01)	0.80 (0.39–1.64)	2.41 (0.81–7.15)
Diabetes	1.54 (0.85–2.80)	0.53 (0.26–1.05)	1.06 (0.59–1.90)	1.06 (0.58–1.93)	0.66 (0.31–1.42)	1.65 (0.68–1.03)
Autoimmune	1.27 (0.70–2.31)	**2.00 (1.05–3.81)**	**3.52 (1.90–6.49)**	**2.19 (1.19–4.03)**	1.29 (0.63–2.65)	**4.86 (1.82–12.95)**
Other [b]	1.12 (0.59–2.13)	0.71 (0.36–1.38)	1.13 (0.61–2.08)	0.74 (0.40–1.38)	0.97 (0.47–2.01)	1.07 (0.42–2.75)

Notes:
Abbreviations: FPD, frequent physical distress; FAL, frequent activity limitations; PGH, poor general health; FMD, frequent mental distress; RNSES, rare/no social-emotional support; DL, dissatisfaction with life.
Significant association in bold font (95% CI does not include value 1).
[a] Adjusted by age and annual gross family income.
[b] Other: hemorrhoids, periodontal disease, and additional specified.
Source: Prepared by the authors from the results of this study.

especially cervical cancer, show high prevalence of psychiatric symptoms (32). An important yet commonly overlooked psychological factor is the symbolic importance of this reproductive organ, often viewed as womanhood and fertility (33). Women may experience poorer body image, lower self-esteem, and a lesser sense of femininity after the removal of or damage to their reproductive organs (33). Similar results have been discussed for patients with ovarian cancer (34).

Many chronic health issues can be preventable; thus, educational campaigns must be done to decrease the incidence of chronic diseases and to reduce the burden of these after a cancer diagnosis. Control and management of comorbidities are also important during cancer treatment (35). Patients with comorbidities have poorer survival, poorer QoL, and higher health care costs (35). Strategies to address these issues include improving evidence-based interventions for patients with comorbidities, further development of clinical tools to assist decision-making, improved integration and coordination of care, and skill development for clinicians (35).

Potential limitations of this study include information bias, given that comorbidities were self-reported by study participants and not confirmed by medical record review. Also, close to 17% of the original sample size was lost due to missing values, limiting the generalization of study results to the entire population. Nonetheless, after Pearson's Chi-square test evaluations, there were non-significant differences of relevant sociodemographic and clinical variables between the study sample and the 17.2% lost ($p \geq 0.05$), reducing the potential for selection bias. Finally, due to the sample size, it was not possible to evaluate the impact on QoL of specific diseases within each category of comorbidity evaluated (CVDs, diabetes, autoimmune diseases). Not evaluating this limited our ability to assess which specific comorbidities (i.e., HIV, lupus) have greater impact on QoL.

Recommendations for future research include to assess the burden of comorbidities due to the possibility that one disease may represent a greater weight of disability/mortality than another. Other chronic or long-term diseases in this population should be taken into consideration, such as chronic obstructive pulmonary disease (COPD), kidney disease, and Alzheimer's disease. Finally, it is recommended to consider the effect that active treatment can have on the QoL of these patients, as well as the number of years they have been suffering from the conditions of interest.

Conclusion

Physical and mental QoL dysfunctions were highly prevalent in this Hispanic population of gynecologic cancer patients. Suffering from autoimmune comorbidities significantly exacerbated those dysfunctions. Public health efforts for cancer patients should focus on interventions that target comorbidity prevention and control among this group, as well as on proper cancer treatment management, to reduce the burden of these in their QoL. Access to adequate support systems should also be reinforced for this population. Public health institutions should partner with community and non-profit organizations and health service providers to promote and improve healthy lifestyles among cancer survivors.

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Efecto de las comorbilidades crónicas sobre la calidad de vida de pacientes con cáncer ginecológico en Puerto Rico

RESUMEN

Objetivo. Describir la prevalencia de enfermedades crónicas y evaluar la asociación entre varias comorbilidades y la calidad de vida de pacientes con cáncer ginecológico en Puerto Rico.

Métodos. Se llevó a cabo un estudio transversal con 233 mujeres de 21 años o más con diagnóstico de cáncer ginecológico. Mediante entrevistas telefónicas se evaluó la información sobre comorbilidades, calidad de vida y otras covariantes; para la calidad de vida, se evaluaron seis elementos relativos a la salud física y mental. Se emplearon modelos de regresión logística con múltiples variables para estimar la magnitud de la asociación entre las comorbilidades objeto de estudio (la diabetes, las enfermedades cardiovasculares y las enfermedades autoinmunitarias) y los elementos relativos a la calidad de vida, mediante una razón de posibilidades de prevalencia ajustada (RPPa; intervalo de confianza [IC] de 95 %).

Resultados. La mayoría de las mujeres (90,1 %) notificaron una o más comorbilidades además del diagnóstico de cáncer; las enfermedades cardiovasculares (63,1 %) fueron más comunes que las enfermedades autoinmunitarias (37,3 %) y la diabetes (33,9 %). Entre 30 % y 40 % de la muestra refirió disfunciones generales de salud (39,5 %) y malestar físico (33,9 %) y mental (31,8 %) frecuente. Luego de ajustar por edad e ingresos brutos familiares, las mujeres con enfermedades autoinmunitarias presentaron una mayor prevalencia de limitaciones frecuentes en las actividades cotidianas (RPPa 2,00; IC de 95 % 1,05-3,81), mala salud general (RPPa 3,52; IC de 95 % 1,90-6,49), angustia frecuente (RPPa 2,19; IC de 95 % 1,19-4,03) e insatisfacción vital (RPPa 4,86; IC de 95 % 1,82-12,95), en comparación con las mujeres que no refirieron ninguna enfermedad autoinmunitaria. No se observó ninguna asociación con enfermedades cardiovasculares o la diabetes.

Conclusiones. Las disfunciones relativas a la calidad de vida tuvieron una alta prevalencia en esta población de pacientes con cáncer ginecológico. Sufrir comorbilidades autoinmunitarias agravó significativamente estas disfunciones.

Palabras clave Calidad de vida; neoplasias de los genitales femeninos; enfermedades cardiovasculares; diabetes mellitus; enfermedades autoinmunes; Puerto Rico.

Efeito das comorbidades crônicas na qualidade de vida de pacientes com câncer ginecológico em Porto Rico

RESUMO

Objetivo. Descrever a prevalência de doenças crônicas e avaliar as associações entre comorbidades e qualidade de vida em pacientes com câncer ginecológico em Porto Rico.

Métodos. Estudo transversal de 233 mulheres com idade ≥21 anos, com diagnóstico de câncer ginecológico. Mediante entrevistas telefônicas, foram avaliadas informações sobre comorbidades, qualidade de vida e outras covariáveis. A avaliação da qualidade de vida incluiu seis itens, abrangendo saúde física e mental. Foram utilizados modelos de regressão logística multivariada para estimar a magnitude da associação entre as comorbidades avaliadas (diabetes, doenças cardiovasculares e autoimunes) e os itens de qualidade de vida, por meio da razão de chances de prevalência ajustada (aPOR) com intervalo de confiança de 95% (IC 95%).

Resultados. A maioria das mulheres (90,1%) relatou uma ou mais comorbidades além de seu diagnóstico de câncer; as doenças cardiovasculares (63,1%) foram mais comuns que as doenças autoimunes (37,3%) e diabetes (33,9%). Entre 30% e 40% das entrevistadas relataram problemas de saúde geral (39,5%) e frequentes problemas físicos (33,9%) e mentais (31,8%). Após ajuste para idade e renda familiar bruta, as mulheres com doenças autoimunes apresentaram maior prevalência de limitação frequente das atividades da vida diária (aPOR 2,00; IC 95% 1,05-3,81), saúde geral precária (aPOR 3,52; IC 95% 1,90-6,49), angústia mental frequente (aPOR 2,19; IC 95% 1,19-4,03) e insatisfação com a vida (aPOR 4,86; IC 95% 1,82-12,95), em comparação àquelas que não relataram doenças autoimunes. Não foram observadas associações com doenças cardiovasculares ou diabetes.

Conclusões. Foi constatada uma prevalência elevada de disfunções de qualidade de vida nesta população de pacientes com câncer ginecológico. Sofrer de comorbidades autoimunes exacerbou significativamente essas disfunções.

Palavras-chave Qualidade de vida; neoplasias dos genitais femininos; doenças cardiovasculares; diabetes mellitus; doenças autoimunes; Porto Rico.