

# Health Care Use Among Endometrial Cancer Survivors

## *A Study From PROFILES, a Population-Based Survivorship Registry*

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**Objective:** Increasing numbers of endometrial cancer survivors place a high burden on the health care system. This study describes the number of visits to the general practitioner, the medical specialist and other care services, compared with the general population, and factors associated with this health care use: age, marital status, education, body mass index, comorbidity, years since diagnosis, and radiotherapy.

**Methods:** Survivors of stage I to stage II endometrial cancer diagnosed between 1999 and 2007 were selected from the Eindhoven Cancer Registry. Survivors (N = 742) completed a questionnaire about their demographic characteristics and health care use. Cancer-related information was retrieved from the Eindhoven Cancer Registry.

**Results:** Endometrial cancer survivors visited their medical specialist more often (3.4 times per year) than the general population. In relation to their cancer, they visited their general practitioner once and their medical specialist twice per year. Use of additional care services was low (14%) but higher among younger survivors (33%). Younger women were more likely to make cancer-related visits to their general practitioner, whereas more highly educated women were less likely to visit their general practitioner and more likely to make cancer-related medical specialist visits. Women with more comorbid conditions were more likely to make general and cancer-related general practitioner visits. Radiotherapy and body mass index were not related to health care use.

**Conclusions:** Endometrial cancer survivors use more health care than women in the general population. Younger women visit their general practitioner more often in relation to their cancer and use more additional care services. More highly educated survivors were more likely to visit a medical specialist in relation to their cancer.

**Key Words:** Delivery of health care, Physicians, Cancer survivorship, Endometrial neoplasms

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Endometrial cancer is the most common gynecological cancer in the Western world and consequently has considerable impact on health care use.<sup>1</sup> In Europe, endometrial cancer is diagnosed in 82,500 women each year,<sup>1</sup> and this number rises as a result of an increase of both elderly and obese women.<sup>2,3</sup> Moreover, owing to the generally good prognosis of 80% 5-year survival, there is a large and growing group of endometrial cancer survivors.<sup>3</sup>

Survivors show an increased specialist care use even long after the end of treatment,<sup>4,5</sup> whereas for primary care use, results are more diverse. Some studies report an increased primary care use among cancer survivors compared to the general population,<sup>6,7</sup> whereas others could not confirm this, possibly owing to small samples.<sup>4,5,8</sup> Health care use differs by cancer type; and therefore, a specific description for endometrial cancer is needed.

Health care use is influenced by a variety of factors. To start with, increased health care use is likely to be influenced by the number of regular follow-ups and the physical and psychological complaints of survivors related to their tumor and treatment history.<sup>9</sup> Moreover, recent studies found increased health care use among cancer survivors who had more comorbid conditions and who were married.<sup>4,8</sup> An association of health care use with educational level was studied in one prior study, where no association was found.<sup>4</sup> Because obesity is related to increased health care use in the general population,<sup>10</sup> this might also be the case among endometrial cancer survivors,<sup>11</sup> although no research on this topic has been published. Furthermore, it is known that radiotherapy, which is often given postoperatively, affects quality of life of endometrial cancer survivors<sup>12,13</sup> and is likely to be associated with health care use accordingly. From these studies, we hypothesize that comorbid conditions, body mass index (BMI), marital status, and treatment are related to health care use among endometrial cancer survivors. Understanding these associations can help in directing the health care system to cope with the increasing number of cancer survivors while keeping a good quality of health care.

The aims of this study were the following: (1) to describe health care use (general practitioner (GP), medical specialist (MS), additional care services) of long-term endometrial cancer survivors; (2) to compare this health care use with that of the general population; and (3) to assess associations between patient and treatment characteristics (age, years since diagnosis, marital status, educational level, BMI, comorbid conditions, radiotherapy, and time since diagnosis) with health care use among endometrial cancer survivors.

## MATERIALS AND METHODS

### Setting and Participants

A population-based cross-sectional survey was conducted in 2008. In total, 1478 patients with newly diagnosed International Federation of Gynecology and Obstetrics stage I or stage II endometrial cancer in the south of the Netherlands between 1999 and 2007 were registered by the Eindhoven Cancer Registry (ECR) of the Comprehensive Cancer Center South covering 10 community hospitals. Of these patients, 198 patients were deceased, 81 patients were 85 years or

older and therefore excluded, 108 patients were treated in a hospital declining participation, and 126 patients had addresses that could not be verified. As a result, 965 endometrial cancer survivors were invited for participation; and 742 women (77%) completed the questionnaire. Details on this survey are described elsewhere.<sup>14</sup> The Medical Ethics Committees of the participating hospitals approved this study.

### Data Collection

Trained registration clerks of the ECR actively collected data on demographics and tumor and treatment information from hospital medical records. Patient-reported outcomes were obtained by questionnaires through Patient-Reported Outcomes Following Initial Treatment and Long-term Evaluation of Survivorship. Patient-Reported Outcomes Following Initial Treatment and Long-term Evaluation of Survivorship is a registry for the study of the physical and psychosocial impact of cancer and its treatment from a dynamic growing population-based cohort of both short- and long-term cancer survivors. Patient-Reported Outcomes Following Initial Treatment and Long-term Evaluation of Survivorship is linked directly to clinical data of the ECR. Data from the Patient-Reported Outcomes Following Initial Treatment and Long-term Evaluation of Survivorship registry is available for noncommercial scientific research, subject to study question, privacy and confidentiality restrictions, and registration ([www.profilesregistry.nl](http://www.profilesregistry.nl)).<sup>15</sup> A letter to inform about the study and the questionnaire was sent to endometrial cancer survivors by their attending gynecologist. By returning the enclosed questionnaire, survivors consented to participate in the study and agreed to the linkage of the questionnaire data with their disease history in the ECR. Nonrespondents were sent a reminder letter and questionnaire within 2 months.<sup>14</sup>

Information on the number of visits to a GP and MS in the general population was obtained from CentERdata, a Dutch research institute at Tilburg University specialized in online survey research ([www.centerdata.nl](http://www.centerdata.nl)). The CentERpanel is an online household panel consisting of more than 2000 Dutch households. The panel is designed to be representative of the Dutch population, including those without Internet access. Data from 2012 were matched on sex, age (in 3 categories), and educational level (in 3 levels), resulting in 78 patients who could be matched with our sample.

### Measures

Tumor, treatment, and patient background information (ie, date of birth, date of diagnosis, stage of disease, and treatment-related aspects) were registered in the ECR. Questionnaires assessed the weight, height, marital status, educational level, comorbid conditions, and health care use. Body mass index was calculated ( $\text{weight [kg]} / \text{height [m]}^2$ ) and categorized according to standard guidelines; normal weight (BMI, <25), overweight (BMI, 25 to <30), obese class I (BMI, 30 to <35) and obese class II (BMI,  $\geq 35$ ).<sup>16</sup> Socioeconomic status was determined by postal code.<sup>17</sup> Comorbid conditions were assessed with the validated Self-administered Comorbidity Questionnaire.<sup>18</sup> Survivors were asked to identify comorbid conditions present in the past 12 months. The adapted

Self-administered Comorbidity Questionnaire lists 14 medical conditions.

Five items were used to assess health care use: (1) How often did you contact a general practitioner in the past 12 months? (2) How many of these visits were related to cancer or the consequences of your cancer? (3) How often did you visit a medical specialist in the past 12 months? (4) How many of these visits were related to cancer or the consequences of your cancer? These 4 questions could be answered by filling in the number of visits. These questions were asked in a similar way as is done by Statistics Netherlands (<http://statline.cbs.nl>). The last question was (5) Did you receive care after the treatment of your cancer? To answer this question, women could either choose “No” or “Yes” and then choose multiple additional care services from a list: psychologist, sexologist, social work, pastoral care, dietician, physical therapist, rehabilitation course, creative therapy, oncology nurse, or contact with other cancer survivors.

## Statistical Analyses

For the descriptive statistics, continuous variables were represented by means and standard deviations and categorical variables by frequencies and percentages. Differences in sociodemographic and clinical characteristics (dependent variables) between respondents, nonrespondents, and patients with unverifiable addresses were compared using analysis of variance for continuous variables and the  $\chi^2$  test for categorical variables. Data from the general population were matched on age and educational level. Differences in health care use between the general population and study participants were compared using analysis of variance.

Multiple logistic regression analyses were conducted to evaluate the relationship between health care use as the dependent variable and the independent variables age, years since diagnosis, marital status, educational level, number of comorbid conditions, and radiotherapy. Variables entered in the regression models were determined a priori and based on our hypotheses. Because health care use was not normally distributed, this variable was dichotomized using median split into the following: visits to GP, zero to 1 versus 2 or more; visit to GP related to cancer, zero versus 1 or more; visit to MS, zero to 1 versus 2 or more; and visit to MS in relation to cancer, zero versus 1 or more. All analyses were performed using Statistical Analysis System (SAS) version 9.2 (SAS Institute, Cary, NC; 1999). *P* values were regarded as significant if *P* < 0.05 and tests were 2 sided.

## RESULTS

### Respondents

Sociodemographic characteristics of respondents, nonrespondents, and patients with unverifiable addresses are shown in Table 1. Respondents were younger and had a higher socioeconomic status than nonrespondents. There were no differences with respect to years since diagnosis, International Federation of Gynecology and Obstetrics stage, and primary treatment.

### Health Care Use

Endometrial cancer survivors did not report significantly more visits to the GP than women in the general population (Table 2), and only a small proportion of the visits to the GP was related to cancer. However, endometrial cancer survivors reported more visits to the MS than women in the general population. In addition, only a minority (14%) of survivors used additional care, except for younger survivors up to 55 years of whom 33% used additional care. The physical therapist and psychologist were the most frequently used additional care services.

### Associations

Logistic regression analyses (Table 3) showed that women visiting their GP twice or more were more likely to have a low educational level, report more comorbid conditions, and have a more recent diagnosis of endometrial cancer than women who reported none or one GP visit. Moreover, women visiting their GP in relation to their cancer were more likely to be younger, report more comorbid conditions, and have a more recent diagnosis than women who did not visit their GP in relation to their cancer. Women visiting their MS twice or more were more likely to report more comorbid conditions and have a more recent diagnosis than women with less than 2 visits to the MS. Women visiting their MS in relation to their cancer were more likely to be more highly educated and have a more recent diagnosis than women with no visits to the MS related to cancer. No association was seen between BMI or radiotherapy and health care use.

With increasing numbers of comorbid conditions, the number of visits to the GP and the MS increases (Fig. 1). However, this association was absent for cancer-specific visits. Interestingly, less highly educated survivors had a higher use of GP care in general, whereas use of MS care related to the cancer was higher among highly educated survivors (Fig. 2). Visits to the GP tend to decrease slightly over time after cancer diagnosis (Fig. 3). Visits to the MS decrease steadily during the first 10 years after diagnosis.

## DISCUSSION

Endometrial cancer survivors use more MS care compared to the general population. Younger endometrial cancer survivors incline to more cancer-related visits to the GP and use more additional care services compared to older survivors. Moreover, highly educated women make more cancer-related visits to their MS than less highly educated women. Health care use was related to more comorbid conditions but not to BMI and radiotherapy treatment.

Our results did not show increased GP use among endometrial cancer survivors compared to the general population. This is in concordance with the results of earlier studies among gynecological,<sup>8</sup> endometrial,<sup>4</sup> and breast cancer survivors.<sup>5</sup> However, analyses of combined groups of cancer survivors showed increased use of the GP.<sup>4,6-8</sup> Differences in GP use might be explained by divergent cancer types or sex related.<sup>4</sup> Regarding gynecological cancer survivors, data are conflicting. Our study and the data of Mols et al<sup>4</sup> show a tendency for increased use, whereas Nord et al<sup>8</sup> describe a

**TABLE 1.** Sociodemographic characteristics of respondents, nonrespondents, and patients with unverifiable addresses

	<b>Respondents (n = 742)</b>	<b>Nonrespondents (n = 223)</b>	<b>Patients With Unverifiable Addresses (n = 126)</b>	<b>P* (n = 1091)</b>
Age, mean (SD), yrs	66.7 (8.5)	69.4 (8.9)	66.8 (10.2)	<0.001
<50–55	58 (8%)	9 (4%)	11 (9%)	
55–65	269 (36%)	59 (26%)	46 (37%)	
65–75	291 (39%)	85 (38%)	39 (31%)	
≥75	124 (17%)	70 (31%)	30 (24%)	<0.001
Years since diagnosis, mean (SD)	4.4 (2.4)	4.8 (2.4)	4.6 (2.3)	0.077
<2	152 (20%)	30 (13%)	20 (16%)	
2 to <5	286 (39%)	93 (42%)	49 (39%)	
≥5	304 (41%)	100 (45%)	57 (45%)	0.167
FIGO stage at diagnosis				
I	686 (92%)	206 (92%)	118 (94%)	
II	56 (8%)	17 (8%)	8 (6%)	0.887
Primary treatment				
Surgery alone	567 (76%)	172 (77%)	102 (81%)	
Surgery and radiotherapy	167 (23%)	49 (22%)	21 (17%)	
Surgery and chemotherapy	8 (1%)	2 (<1%)	3 (2%)	0.444
Socioeconomic status				
Low	164 (23%)	60 (28%)	43 (35%)	
Medium	308 (43%)	90 (42%)	51 (41%)	
High	241 (34%)	62 (29%)	29 (24%)	0.029
BMI, mean (SD)	28.5 (6.0)			
<25	232 (33%)			
25 to <30	236 (33%)			
30 to <35	148 (21%)			
≥35	94 (13%)			
Marital status				
Living together, married	516 (72%)			
Living alone, divorced, widowed	203 (28%)			
Education				
Low (primary or secondary school)	175 (25%)			
Medium (vocational school)	467 (66%)			
High (bachelor or masteral education)	71 (10%)			
No. comorbidities				
0	181 (24%)			
1	199 (27%)			
2	173 (23%)			
3	104 (14%)			
4	52 (7%)			
≥5	33 (4%)			

Data are presented as n (%) unless otherwise indicated.

\*P values report comparison between respondents, nonrespondents, and patients with unverifiable addresses according to analysis of variance and  $\chi^2$  test; SD, standard deviation.

tendency for decreased use. The observed discrepancy might be related to differences in health care systems in these countries. Mols et al and our study were situated in the

Netherlands, whereas the study of Nord et al was situated in a rural county of Norway, possibly leading to decreased access to GP care.

**TABLE 2.** Health care use (mean [SD] or n [%]) of endometrial cancer survivors compared to the general population matched by age and educational level

	Age at Time of Completing the Questionnaire				
	Total Sample	45–55	55–65	65–75	≥75
No. visits to the GP in the past 12 months					
Endometrial cancer survivors (n = 690)	3.4 (4.2)*	3.7 (4.8)	3.1 (3.5)	3.5 (4.7)	3.4 (4.4)
General population (n = 78)	2.8 (2.5)*	2.6 (2.3)	1.9 (1.7)	2.4 (2.3)	5.1 (3.1)
No. visits related to cancer	0.7 (3.2)	1.2 (2.3)	0.7 (2.6)	0.9 (4.3)	0.2 (0.9)
No. visits to the MS in the past 12 months					
Endometrial cancer survivors (n = 686)	3.4 (2.0)†	4.1 (5.9)	3.3 (3.8)	3.3 (3.1)	3.3 (3.6)
General population (n = 78)	2.3 (3.8)†	2.1 (3.1)	0.9 (1.5)	1.9 (2.1)	5.0 (6.7)
No. visits related to cancer	2.2 (3.0)	3.2 (5.6)	2.3 (2.9)	2.0 (2.3)	1.7 (2.9)
Percentage of patients receiving additional care after treatment	101 (14%)	18 (33%)	34 (13%)	34 (12%)	13 (10%)
Physical therapist	42 (5.8%)	10 (19%)	13 (5%)	14 (5%)	5 (4%)
Psychologist	25 (3.4%)	6 (11%)	11 (4%)	4 (1%)	2 (2%)
Rehabilitation course	18 (2.5%)	6 (11%)	6 (2%)	6 (2%)	0 (0%)
Social work	17 (2.3%)	3 (6%)	2 (1%)	6 (2%)	6 (5%)
Dietician	16 (2.2%)	3 (6%)	3 (1%)	8 (3%)	2 (2%)
Oncology nurse	11 (1.5%)	2 (4%)	7 (3%)	2 (1%)	0 (0%)
Contact with other cancer survivors	10 (1.4%)	1 (2%)	5 (2%)	3 (1%)	1 (1%)
Creative therapy	4 (0.6%)	0 (0%)	3 (1%)	1 (0%)	0 (0%)
Sexologist	3 (0.4%)	2 (4%)	1 (0%)	0 (0%)	0 (0%)
Pastoral care	2 (0.3%)	0 (0%)	1 (0%)	0 (0%)	1 (1%)

Data are presented as n (%) unless otherwise indicated.

\**P* value for difference between the total samples of endometrial cancer survivors and general population for GP use was 0.287.

†*P* value for difference between the total samples of endometrial cancer survivors and general population for MS use was 0.015.

It is interesting to note that both our study and a study among breast cancer survivors<sup>5</sup> reported more additional care use in younger cancer survivors. This seems in contradiction with the fact that young endometrial cancer survivors experience better physical and role functioning compared to older survivors.<sup>19</sup> However, several explanations are possible. First, the higher health care use of younger endometrial cancer survivors might be related with the higher demands of younger survivors owing to work and/or responsibility for children and a more assertive attitude to access of care. Second, younger women who enter menopause due to the cancer treatment have a decreased comparability with their age-matched norm population, which might lead to increased health care use. And third, younger survivors might experience better health as a consequence of their increased health care use. Furthermore, we found that women who are more highly educated use more MS care in relation to their cancer, indicating possible social inequality in access to health care. Explanations for this might be that more highly educated survivors more actively look for MS care when having questions or complaints, that their follow-up is more frequently scheduled, that they attend the follow-up visits more accurately, or that they perceive a higher threat of the cancer diagnosis. The more frequent use of specialist care by more highly educated women warrants further research: do they

perceive more fear and need specific counseling, do they perceive more complaints, or do they find their way into specialist care more easily?

In concordance with our study, recent studies demonstrated that in cancer survivors, increased GP and MS consultation is associated with having comorbid conditions.<sup>4,8</sup> For many cancer survivors, cancer is only one of the health problems they seek medical attention for, as 60% of them have one or more comorbid diseases.<sup>20</sup> This is important to keep in mind when considering the follow-up care for cancer survivors.

Surprisingly, we did not find a relation between radiotherapy or BMI and increased health care use. Because radiotherapy has a negative impact on morbidity,<sup>14</sup> it is surprising that this higher morbidity does not translate into higher health care use for either GP or MS. However, the nonsignificant result might be related to insufficient power in this study, as we observed an odds ratio of 1.5 (CI, 0.94–2.41) for MS use related to cancer. In addition, for BMI, the expected relation was not found. Because it is known that obesity is related to decreased quality of life<sup>21</sup> and increased GP use in the general population,<sup>10</sup> we expected BMI to be related to health care use in endometrial cancer survivors. A sensitivity multiple regression analysis to assess the association of BMI and health care use without having comorbid

**TABLE 3.** Multivariate logistic regression analyses evaluating sociodemographic and clinical characteristics for visiting the GP and MS in general and in relation to cancer (all median split) in the past 12 months (Odds Ratio and 95% Confidence Interval)

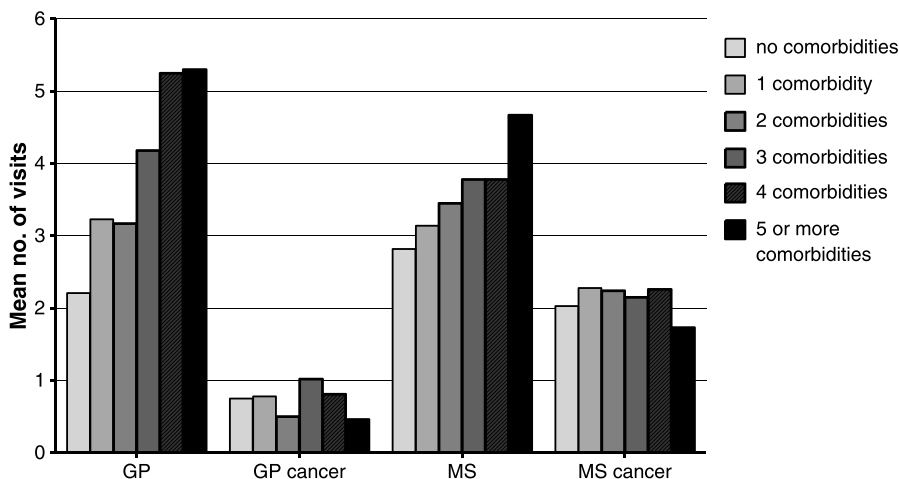
	Visiting the GP Twice or More (n = 674)		Visiting the GP Related to Cancer Once or More (n = 643)	
	OR	95% CI	OR	95% CI
Age at time of survey	1.00	(0.98–1.02)	<b>0.96</b>	<b>(0.94–0.99)</b>
Marital status (married is reference)	1.35	(0.92–1.95)	1.26	(0.79–2.03)
Medium education (low is reference)	1.06	(0.71–1.57)	1.52	(0.87–2.66)
High education (low is reference)	<b>0.46</b>	<b>(0.24–0.85)</b>	1.41	(0.65–3.07)
BMI	0.99	(0.96–1.02)	0.97	(0.94–1.01)
No. comorbidities	<b>1.49</b>	<b>(1.31–1.69)</b>	<b>1.18</b>	<b>(1.01–1.37)</b>
Years since diagnosis	<b>0.90</b>	<b>(0.84–0.96)</b>	<b>0.84</b>	<b>(0.77–0.92)</b>
Radiotherapy (no radiotherapy is reference)	0.84	(0.57–1.23)	1.33	(0.81–2.18)
	Visiting the MS twice or more (n = 670)		Visiting the MS related to cancer once or more (n = 641)	
	OR	95% CI	OR	95% CI
Age at time of survey	1.01	(0.99–1.03)	1.00	(0.97–1.02)
Marital status (married is reference)	0.75	(0.51–1.11)	1.02	(0.65–1.59)
Medium education (low is reference)	1.05	(0.69–1.59)	1.19	(0.74–1.91)
High education (low is reference)	1.36	(0.72–2.57)	<b>2.26</b>	<b>(1.06–4.82)</b>
BMI	1.01	(0.98–1.04)	1.02	(0.99–1.05)
Number of comorbidities	<b>1.25</b>	<b>(1.10–1.42)</b>	0.96	(0.84–1.10)
Years since diagnosis	<b>0.70</b>	<b>(0.65–0.76)</b>	<b>0.57</b>	<b>(0.52–0.62)</b>
Radiotherapy (no radiotherapy is reference)	1.33	(0.88–2.00)	1.50	(0.94–2.41)

Bold indicates significance ( $P < 0.05$ ).

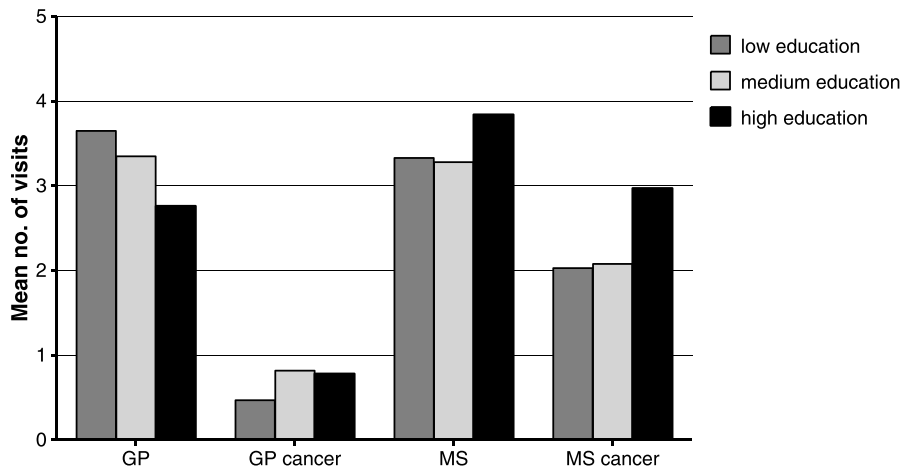
condition in the model showed no association. We do not have other possible explanations for this finding.

A variety of strategies might be useful to lower health care costs for cancer follow-up care, although research on this

topic is still needed for endometrial cancer care. Although not all hospitals in the Netherlands have a specialized nurse for gynecologic oncology patients, their role in follow-up care might be enlarged by transition medical specialist care to



**FIGURE 1.** Health care use by number of comorbid conditions.



**FIGURE 2.** Number of visits to the GP and MS in general and in relation to the cancer in the past 12 months by educational level.

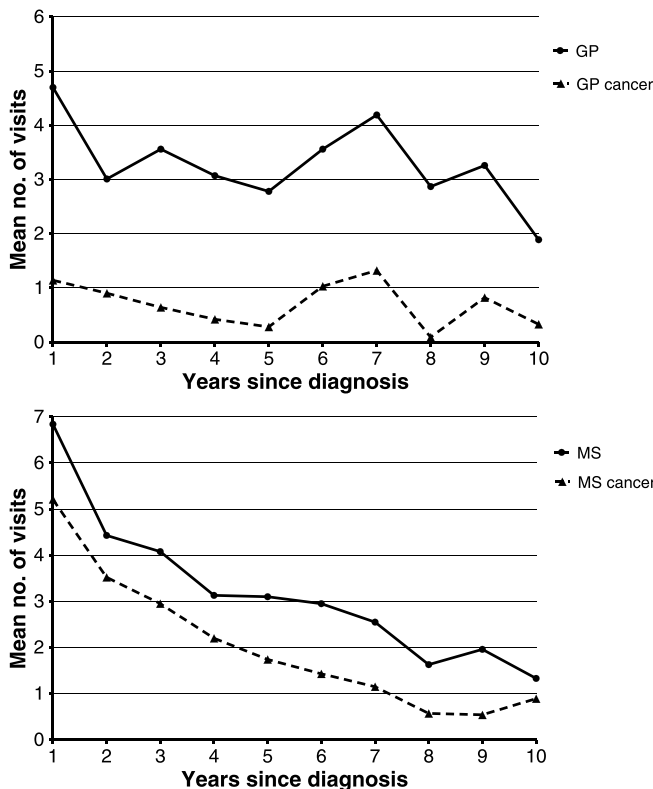
specialized nurse care. Alternatively, follow-up care could be transitioned to the general practitioner, or the intensity of follow-up care could be diminished, as evidence for current follow-up practice is largely lacking.<sup>22</sup>

**Strengths and Limitations**

Health care use was based on self-reported data, where recall bias might have led to selective variation in response.

However, effects are probably similar for the cancer survivors and the general population. Moreover, nonresponse might be related to health care use. This is especially the case if nonresponse is caused by illness.<sup>23</sup> In that case, our results are an underestimation of the true health care use.

Despite the limitations noted, strengths could also be identified. The current study is one of the first studies that examine the health care use of a large group of endometrial cancer survivors and evaluates characteristics associated with health care use. A second strength is the large population-based study sample and high response rate, which enhances the generalizability of this study. Finally, the age and educational level–matched norm sample makes a good comparison to the general population possible.



**FIGURE 3.** Number of visits to the GP and MS in general and in relation to the cancer in the past 12 months by year after diagnosis: cross-sectional analysis.

**CONCLUSIONS**

The increase in the number of endometrial cancer survivors will put an increasing pressure on the specialist care, as we found that endometrial cancer survivors more frequently visit the MS than women in the general population. Younger women seem to have higher health care needs. Moreover, more highly educated survivors visit their MS more often in relation to their cancer, indicating that they find their way to hospital care more easily, which can be a signal of inequality in access of care. Transition of care to the primary care physician or nurse practitioners might support long-term accessibility of care for endometrial cancer survivors. In addition, research into the effect of decreasing the number of follow-up visits as formulated in the national guideline might be a feasible alternative. However, special attention should be given to more highly educated and younger women, as they currently have a higher MS use.

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