

# Regional Perspectives on Complementary and Alternative Medicine: Results of a Regional Survey

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## Keywords

Cancer · Residence · Complementary and alternative medicine · Rural areas · Sweden · Urban areas

## Abstract

**Background:** Complementary and alternative medicine (CAM) is widely used by patients with cancer. Research indicates that the use of CAM is more prevalent in rural areas compared to urban areas. There is currently a lack of information regarding the scope and specifics of CAM use among patients in Sweden, particularly in rural areas. The aim of this study was to estimate the extent and characteristics of CAM use among cancer patients in the rural areas of Region Gävleborg. **Methods:** A total of 631 questionnaires were sent out, and 376 of those were returned, corresponding to a response rate of 59.6%. Oncology patients received questionnaires at their initial appointment for curative care at Gävle Hospital's Department of Oncology. When enrolling in palliative outpatient care in their homes, palliative patients were sought out. Standard descriptive statistics were used to present the characteristics of the respondents. To determine odds ratios and potential factors (age, gender, diagnosis, and education) affecting CAM use after cancer diagnosis, a multivariable logistic model was constructed. **Results:** Based on clinical observations, the authors' hypothesis that CAM use is particularly common in small towns in the Hälsingland region was verified in this study. This was particularly pronounced among younger people and residents

of small towns in the province of Hälsingland. The higher level of CAM use appears to apply to both men and women. **Conclusions:** CAM appears to be used more frequently by patients residing in rural areas. It is crucial that care providers enquire about all of the patient's health-seeking activities. Further research is needed on the usage of CAM in rural areas and the potential cultural influences contributing to CAM use. From a sociological standpoint, it is crucial to draw attention to the fact that CAM use may be more prevalent in certain rural areas, particularly in centralized societies where it is more difficult to access healthcare in remote regions.

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## Komplementär- und Alternativmedizin aus regionaler Sicht: Ergebnisse einer regionalen Befragung

### Schlüsselwörter

Krebs · Komplementär- und Alternativmedizin · Schweden · Ländlicher Raum · Städtischer Raum · Wohnraum

### Zusammenfassung

**Hintergrund:** Die Komplementär- und Alternativmedizin (KAM) wird von Krebspatienten häufig in Anspruch genommen. Die Forschung deutet darauf hin, dass sie im

ländlichen Raum stärker verbreitet ist als in der Stadt. Bisher mangelt es an Informationen zum Umfang und konkreten Ausgestaltung der KAM-Anwendung durch Patienten in Schweden, insbesondere im ländlichen Raum. Das Ziel dieser Studie war es, das Ausmaß und die Merkmale der KAM-Anwendung durch Krebspatienten im ländlichen Raum in der Region Gävleborg zu untersuchen.

**Methoden:** Insgesamt 631 Fragebögen wurden ausgegeben und 376 zurückerhalten, was einer Rücklaufquote von 59.6% entspricht. Onkologische Patienten erhielten den Fragebogen jeweils bei ihrem ersten Termin im Rahmen einer kurativen Behandlung in der onkologischen Abteilung am Krankenhaus Gävle. Palliativpatienten wurden bei der Aufnahme in die ambulante Palliativversorgung ausgewählt. Die Merkmale der Befragten wurden mit standardmäßigen deskriptiven Statistiken dargestellt. Zur Ermittlung der Chancenverhältnisse und möglichen Einflussfaktoren (Alter, Geschlecht, Diagnose und Bildungsstand) in Bezug auf die KAM-Anwendung nach einer Krebsdiagnose wurde ein multivariates logistisches Modell erstellt. **Ergebnisse:** Die auf klinischen Beobachtungen beruhende Hypothese der Autoren, dass Komplementär- und Alternativmedizin (KAM) in der Region Hälsingland besonders in kleinen Orten häufig in Anspruch genommen wird, wurde in dieser Studie bestätigt. Besonders ausgeprägt war dies bei jüngeren Menschen und Einwohnern von kleinen Orten in Hälsingland. Die höhere Verbreitung der KAM-Anwendung gilt für Männer und Frauen gleichermaßen. **Schlussfolgerungen:** KAM scheint von Patienten, die im ländlichen Raum leben, stärker in Anspruch genommen zu werden. Es ist sehr wichtig, dass Behandelnde ihre Patienten zu allen ihren Aktivitäten der Gesundheitsförderung befragen. Weitere Forschung zur Anwendung von Komplementär- und Alternativmedizin (KAM) im ländlichen Raum und die möglichen kulturellen Einflussfaktoren für die KAM-Anwendung ist erforderlich. Aus soziologischer Sicht ist es wichtig, darauf hinzuweisen, dass die KAM-Anwendung möglicherweise in bestimmten ländlichen Gegenden stärker verbreitet ist, insbesondere in zentralistischen gesellschaftlichen Raumordnungen, in denen der Zugang zur Gesundheitsversorgung in entlegeneren Regionen erschwert sein kann.

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## Introduction

There is no universally agreed definition of CAM [1]. However, one of the most commonly used classifications is that complementary and alternative medicine (CAM) comprises various methods and products that are not part of standard medical care. Complementary medicine is

applied in combination with standard medical care, while alternative medicine is used instead of standard medical treatment. Integrative care attempts to incorporate natural products, mind-body practices and/or other complementary healthcare techniques into conventional therapy [2].

The fact that cancer patients use CAM is well established [3–8]. According to a review of CAM use in the Scandinavian countries, the prevalence of CAM use is between 7.9% and 53%, with an average of 36% across all studies [7]. This is consistent with a more recent study, which estimates that about 30% of cancer patients in Europe use CAM [9].

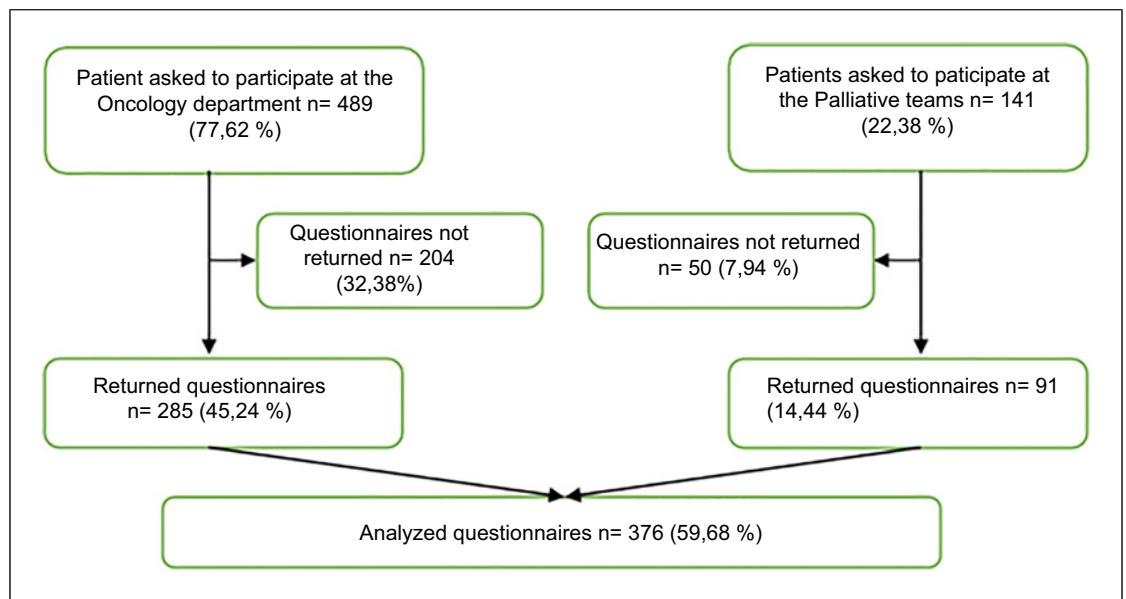
In a study of patients in the region of Gävleborg, Sweden, which was recently published, 54% of all participants reported CAM use at some point in their lifetime, while 34% reported CAM use after a cancer diagnosis [10]. The majority of studies of CAM prevalence show that the use of complementary therapy is higher among women with a higher education [6–8, 10–13] and those with poorer self-reported health [6, 11].

Most cancer patients initiate CAM use to enhance their wellbeing, where the perceived value of CAM includes empowerment, control, curative properties, and improved quality of life [5, 8, 10]. The most frequently used CAM practices include massage, acupuncture, cupping, reflexology, naprapathy, osteopathy, and spiritual healing [14], and a single CAM therapy may be used by patients for multiple purposes [14]. In a study [15] that included patients with metastatic breast cancer, the primary reason for using CAM varied depending on the modality. Another study [16] found that the top three motivations for using CAM were (1) expected benefits from CAM, (2) dissatisfaction with traditional therapy, and (3) the belief that CAM is safe.

Advanced cancer is a stressful condition that affects the patient in all dimensions. This covers not just bodily symptoms, but also the psychological and emotional symptoms [17]. Altered body image, impaired emotional function, and elevated levels of hopelessness are associated with psychological stress in patients with advanced cancer [18]. There may be an association between the use of CAM and high levels of stress and long-term health problems [13].

Some research indicates that the use of CAM is more prevalent in rural areas compared to urban areas [19, 20]. The rural population is commonly believed to be more likely to use “folk remedies” and self-care practices, although data on CAM use among rural patients and the extent to which CAM are integrated with mainstream medicine are scarce [21]. Furthermore, it can be difficult to study CAM use in a rural context [20].

The Swedish region of Gävleborg has around 287,000 inhabitants in an area of 18,919 km<sup>2</sup>. The region consists of two provinces, Gästrikland and Hälsingland, with



**Fig. 1.** Flowchart of data collection.

roughly the same population. However, the population density is much lower in Hälsingland (9.2 inhabitants/km<sup>2</sup> compared with 37.6 inhabitants/km<sup>2</sup> in Gästrikland). Although Gästrikland and Hälsingland are neighbouring provinces, there are some cultural differences. Gästrikland has a rich industrial history and is known for its forges and ironworks, while Hälsingland is known for its unique folk art and strong agricultural and rural character. Sweden has a tax-funded healthcare system and care is available to everyone. Gävleborg offers essential health services through its hospitals, but workforce shortages and geography pose certain access barriers, particularly in remote or sparsely populated areas. Patients may need to travel longer distances to access specialized services.

### Hypothesis

An initial hypothesis was that CAM use may be more common in the small towns in Hälsingland. This was based on clinical experiences from patient visits and previous findings in the literature that CAM use is more common in rural areas. The aim of this study was to elucidate whether this hypothesis could be verified and to examine variations in CAM use in these provinces.

## Methods

### Patients

Patients in the Region Gävleborg who had been diagnosed with cancer and started treatment with adjuvant chemotherapy at the Department of Oncology at Gävle Hospital clinic and patients enrolled in the palliative

home care program offered by the hospital were invited to participate in the study (Fig. 1). Gävle Hospital is by far the largest hospital in Region Gävleborg and the only hospital with an oncology clinic. Each year, the Department of Oncology at Gävle Hospital receives between 800 and 1,000 individual visits. The palliative home care team of Gävle Hospital serves about 225 patients per year.

The present study is based on the hypothesis that CAM use is more common in small towns. We have therefore chosen to divide the place of residence for all participants into small and large towns based on the number of inhabitants. Large towns were defined as towns with 10,000 inhabitants (small towns <10,000 inhabitants) or more based on a report on urban areas, localities, and smaller localities from Statistics Sweden [22]. This resulted in the subgroups of small and large towns in both Gästrikland and Hälsingland.

### Study Design

The study used a cross-sectional design. The questionnaire consisted of 19 questions with yes/no answers, multiple answers, and free text. The questions included topics such as demographics, use of CAM, reasons for using CAM, methods used, and patients' experiences and opinions regarding CAM (online suppl. Material 1; for all online suppl. material, see <https://doi.org/10.1159/000540663>).

The question on the current use of CAM referred to the date the respondents completed the questionnaire. The questionnaire was previously developed and used by Molasiottis et al. [6]. Wode et al. [8] translated the questionnaire into Swedish and made some changes. In collaboration with the authors Wode and colleagues [8]

Nordberg, the questionnaire was modified based on the researchers' opinions and comments. We excluded the origin of the disease and made some minor changes to the specification of CAM methods based on knowledge of the preparations that are frequently used locally, for example, chaga (tree fungus that grows on birch trees) and birch ash (natural product obtained from birch trees), and made some graphic and linguistic changes to the survey.

The inclusion criteria were 18 years or older and starting chemotherapy treatment for the first time in the Department of Oncology in Gävleborg Hospital or about to receive palliative cancer care from the palliative home care team in Gävle, Region Gävleborg, with or without previous cancer treatment. The exclusion criteria were history of previous chemotherapy treatments in Region Gävleborg due to current or previous illness, or cognitive impairment or other comorbidities that hindered the ability to complete a questionnaire, as established through the medical evaluation of the study staff. Participants were required to be residents of the Gävleborg, except for residents of Älvkarleby Municipality (part of a neighbouring region), whose residents receive care in Region Gävleborg.

The first survey was released on June 13, 2017, and the selection process was closed on December 31, 2018, as the number of participants was considered adequate based on a previous power calculation linked to a previous study with this sample group, where 260 patients would be needed to reach 90% power at a significance level of 0.05. A sealed envelope with the patient's address and study information (written information about the study, voluntary participation, and confidentiality) was included in the survey. The nurse in charge of the study, who was updated daily on new patients starting chemotherapy through an administrative reservation system, informed new patients about the study and asked if they would like to be included. In the event that the study manager was absent, the update was done retroactively, and a survey with patient information was sent to the patient's home. The palliative home care team distributed questionnaires to patients deemed suitable for inclusion. Social security numbers and related application codes were sent to the study director, who handled them according to the study protocol. Two rounds of reminders were sent to interviewed patients who did not return a questionnaire or consent form, the first after 2 weeks and the second 1 month after the first. Before sending the reminder, the patient's life status was checked in Region Gävleborg's patient booking system. The study was approved by the Uppsala Regional Ethics Review Board (Dnr. 2016/360).

#### *Statistics and Data Analysis*

Quantitative data were presented as median, interquartile range (IQR: 25–75%), and range (minimum–maximum). Categorical data were expressed as

proportions. A multivariate logistic model was fitted to calculate odds ratios (ORs) and identify potential predictors (age, gender, education, diagnosis) of CAM use post-cancer diagnosis.

The results were presented as ORs with corresponding 95% confidence intervals. *p* values <0.05 were considered statistically significant. All statistical calculations were performed using R version 4.3.2 [23].

Cochran-Armitage trend test was used to test for linear trend in a binomial variable (CAM use post-cancer diagnosis = Yes [1], No [0]) across levels of a single variable on the ordinal scale. The binomial variable with two levels represents the response, and the ordinal variable acts as an explanatory variable with several ordered levels. The null hypothesis states that there is no trend, which means the same binomial proportions of the response variable hold for all levels of the ordinal explanatory variable. In order to detect possible associations between two categorical variables, Pearson's  $\chi^2$  test was used.

## **Results**

### *Demographics and Use of CAM*

In total, 376 observations were available for analysis in this study. Due to incomplete data on level of education, two cases were excluded. Overall, 34.8% (130/374) of respondents reported using CAM after diagnosis and 49.5% (185/374) reported using CAM before diagnosis. Divided by treatment intention post-cancer diagnosis, 104 patients were in the curative group treated at the oncology department and 26 patients were in the palliative group treated at home care. The post-cancer diagnosis group consisted of a total of 55 men and 75 women (Table 1).

In the study population, the median age was 69 years. Among those who used CAM, the median age was 63 years. The most prevalent diagnoses in the total population were related to gastrointestinal disorders and breast cancer. Regarding education level, the majority of participants had completed elementary school, high school, and university.

Among the subjects in the study, the most common post-diagnosis methods used were vitamins and minerals (16%), health food preparations (14.7%), herbal teas (6.7%), prayer (6%), and chaga (6%). Among the reasons for using CAM, participants reported a desire to improve physical well-being (48.9%), general well-being (45.8%), and the body's ability to fight cancer (38.9%). The benefits experienced through CAM use primarily included improvement of general well-being (39.7%), physical well-being (35.9%), and emotional well-being (27.5%).

**Table 1.** Patient characteristics in survey with excluded cases

	CAM yes	CAM no	Total
Total			
Total	130 (100)	244 (100)	374 (100)
Age, years			
Median (Q1–Q3)	63 (54–72)	70 (64–76)	69 (60–75)
Min–max	24–90	23–91	23–91
Gender			
Women	75 (57.7)	94 (38.5)	169 (45.2)
Men	55 (42.3)	150 (61.5)	205 (54.8)
Education			
Elementary school	31 (23.8)	122 (50.0)	153 (40.9)
Gymnasium	49 (37.7)	77 (31.6)	126 (33.7)
University	50 (38.5)	45 (18.4)	95 (25.4)
Missing	0 (0.0)	0 (0.0)	0 (0.0)
Diagnosis			
Breast	44 (33.8)	50 (20.5)	94 (25.1)
Gastrointestinal	38 (29.2)	98 (40.2)	136 (36.4)
Gynaecological	2 (1.5)	1 (0.4)	3 (0.8)
Head, neck, lung, or skin cancer	13 (10.0)	26 (10.7)	39 (10.4)
Haematological	0 (0.0)	0 (0.0)	0 (0.0)
Sarcoma	1 (0.8)	1 (0.4)	2 (0.5)
Urogenital	19 (14.6)	45 (18.4)	64 (17.1)
Unknown	2 (1.5)	5 (2.0)	7 (1.9)
Residence			
Hälsingland, larger towns	17 (13.1)	37 (15.2)	54 (14.4)
Gästrikland, larger towns	54 (41.5)	92 (37.7)	146 (39.0)
Hälsingland, smaller towns	40 (30.8)	56 (23.0)	96 (25.7)
Gästrikland, smaller towns	19 (14.6)	59 (24.2)	78 (20.9)
Intention of treatment			
Curative	104 (80.0)	181 (74.2)	285 (76.2)
Palliative	26 (20.0)	63 (25.8)	89 (23.8)

Numbers are *n* (%) unless otherwise stated. Residence: smaller towns (population <10,000); larger towns (population ≥10,000).

### Factors Affecting the Use of CAM

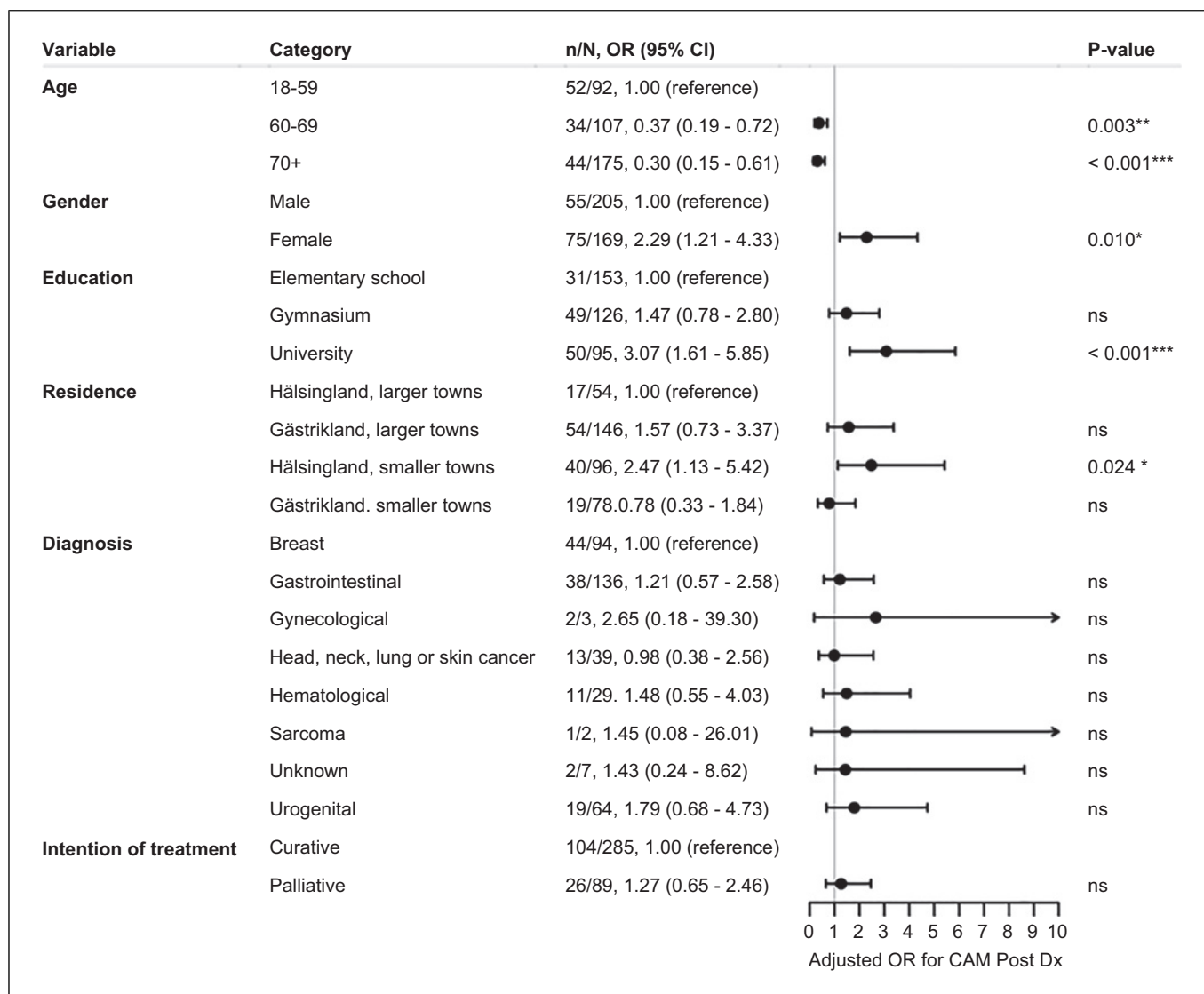
The variables age (*p* value 0.005), gender (*p* value 0.001), and level of education (*p* value 0.001) were statistically significantly linked with CAM use after diagnosis in the large cohort without intention-to-treat stratification, according to Pearson’s  $\chi^2$  test. Using a multivariable logistic regression model that incorporated age, gender, education, type of tumour, residence, and treatment intent into a multivariable logistic regression model, female gender (OR: 2.29, *p* = 0.010) and university education (OR: 3.07, *p* < 0.001) were significantly associated with a higher likelihood of CAM use, whereas increasing age was associated with a lower degree of CAM use. Also, living in a small town in Hälsingland was significantly associated with a higher likelihood of CAM use (OR: 2.47, *p* = 0.024) compared to living in a large town in Hälsingland (Fig. 2).

Further analysis shows that there is a statistically significant difference regarding lower use among residents of small cities in Gästrikland versus small cities in Hälsingland (OR: 0.25, *p* = 0.002). When only curative patients were included in the multivariable model, there

was a significant association between younger age, female gender, and university education for participants residing in a small town in Hälsingland and a higher likelihood of CAM use, whereas these associations were not found when only palliative patients were included.

The data indicated that age appeared to have a greater impact on women’s CAM use than on men’s CAM use. When divided into three subgroups based on age (ages 18–59, 60–69, and 69+), it was shown that the use of CAM was higher in all three female subgroups compared with the male subgroups, but the difference was most pronounced in the youngest age group. Analyses with the Cochran-Armitage test for trend over time show a *p* value of 0.042 for men and 0.012 for women in the group residing in small towns in Hälsingland (Table 2). A statistically significant difference was found, where we see a much greater difference in the use of CAM for different ages depending on whether participants live in large or small cities (Fig. 3).

The reported level of education of the participants appears to have a greater impact on women’s CAM use



**Fig. 2.** Forest plot for full model by residence (4 categories).

compared to men. Women with a university education have an OR of CAM use of 2.908 compared to men with the same level of education. It is notable that the analysis in this case did not turn out to be statistically significant but may have clinical significance.

## Discussion

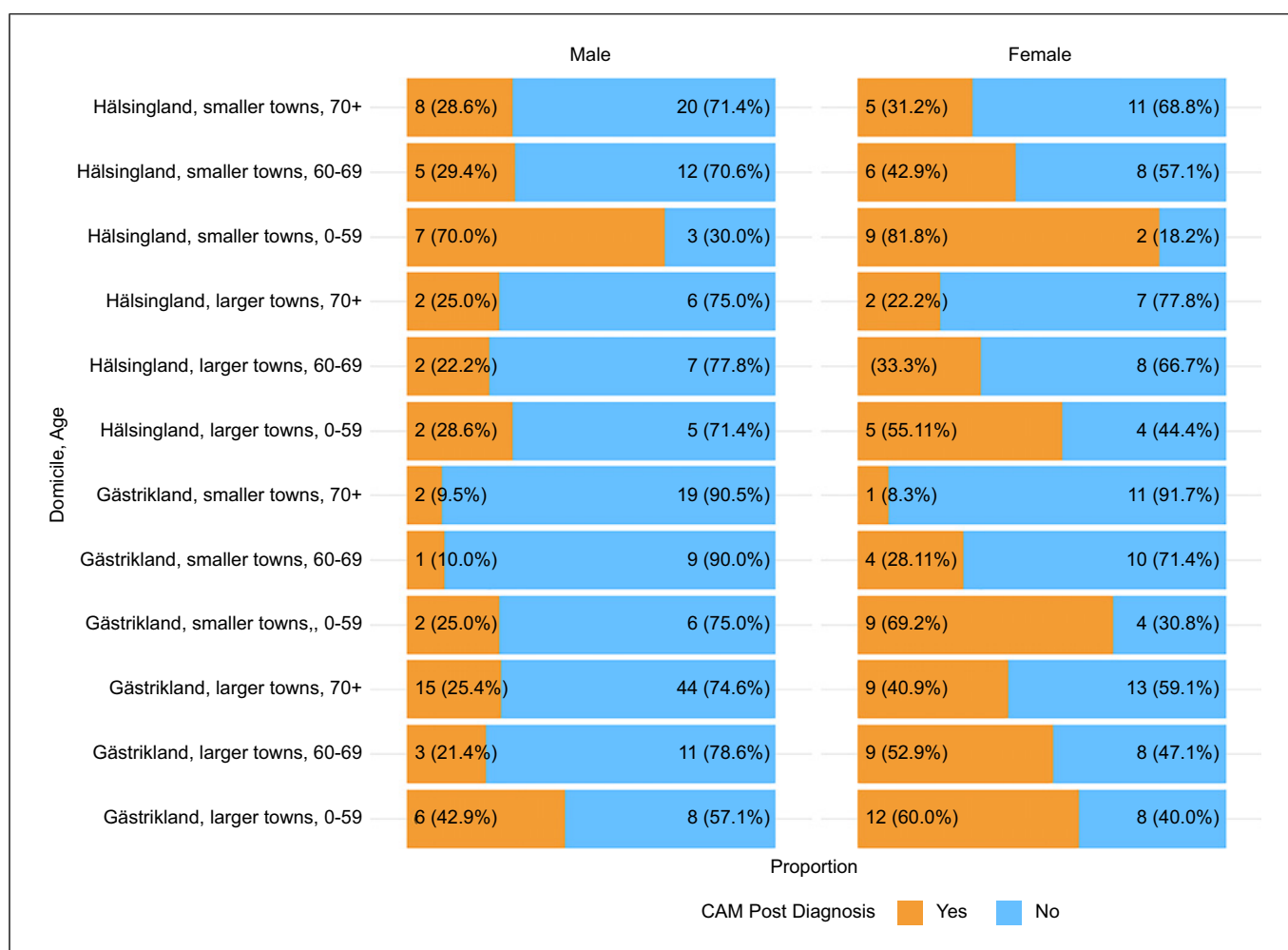
### Main Findings

The results of this study showed that younger women with a higher level of education are the most frequent users of CAM. Additionally, we discovered that CAM use is more prevalent in less populated areas and that CAM users in these areas tend to be younger.

**Table 2.** Cochran-Armitage test for trend over age for CAM post-diagnosis by domicile and gender

Group	p value
Hälsingland, smaller towns, male	0.042*
Hälsingland, smaller towns, female	0.012*
Hälsingland, larger towns, male	ns
Hälsingland, larger towns, female	ns
Gästrikland, smaller towns, male	ns
Gästrikland, smaller towns, female	0.001**
Gästrikland, larger towns, male	ns
Gästrikland, larger towns, female	ns

ns:  $p > 0.05$ . \* $p \leq 0.05$ . \*\* $p \leq 0.001$ .



**Fig. 3.** Proportion of CAM post-diagnosis by residence, age, and gender.

### CAM Use in Urban versus Rural Areas

There has been an increase in public awareness and acceptance of CAM over the past few decades [24–27]. The results of a recently published paper [10] showed that more than half (54%) of the participants reported lifetime use of CAM and 34% of those included in the study reported the use of CAM post-cancer diagnosis. Another study reported CAM use post-cancer diagnosis at 26% [8]. Further, compared to previous studies, the present study showed that CAM is more widely used in Gävleborg, which is mainly a rural area, than in Stockholm, the capital of Sweden and primarily an urban area. Most previous studies have found that the typical CAM user tends to be a young woman with a high level of education, which appears to be a predisposing factor for the typical CAM user [6–8, 10, 25, 28]. Our findings are consistent with previous studies.

Other studies have shown that CAM use is more prevalent in sparsely populated areas [20, 29], which is consistent with the findings of this study. Based on clinical observations in the present study, the authors confirmed the hypothesis that the use of CAM is especially prevalent in

small towns in the Hälsingland region. Furthermore, it is primarily younger people living in small towns in Hälsingland who stand out. This appears to be true for both men and women. The literature shows that the typical CAM user tends to be younger, but a recent review showed that the relationship between CAM use and age is not completely clear, and further research is needed [30].

One observation from the present study is that the Internet and social media can often be good sources of information and sources of misinformation about healthcare [31]. Younger people use social media at a higher rate than the elderly. It is used as a source of information, where users attempt to learn and gather knowledge that enables them to take a more active role in managing their own health [32].

On the other hand, for respondents living in small towns in the Gästrikland province, there was no statistically significant association between town size and increased CAM use. Rather, the results indicate a possible opposite effect compared to the other categories of residence and town size, although the results were not statistically significant. This is an interesting finding, which could indicate that it may not only

be the rural or urban context that is significant but also the cultural context of the region. Over millennia, CAM has evolved by relying on the religious beliefs and social systems of different indigenous peoples, as well as by harnessing natural materials from the local environment [33]. CAM use is often influenced by cultural and traditional beliefs, which can shape people's attitudes and behaviours toward health-care and healing practices [34]. From the start of our patient journey, our culturally constructed model of explanation influences how we feel and interpret our illness, as well as how we make decisions and approach CAM and biomedicine [35].

One study from the USA found that cultural beliefs and practices influenced the use of CAM among Hispanic immigrants in the USA. The study found that traditional Hispanic beliefs, such as the use of natural remedies and the importance of balance and harmony, were associated with the use of CAM [36].

It may be difficult to fully trace CAM use to cultural origins. From a cultural and historical standpoint, different countries and regions may have different perspectives on specific cures and self-medication [3]. Cultural beliefs can also affect people's perceptions of conventional medicine and their willingness to use CAM therapies in conjunction with, or as an alternative to, conventional treatments. This area is not well understood, and to our knowledge, there has been no previous research on the subject in a Swedish context.

Apart from cultural reasons, other possible reasons for increased CAM use may be a lack of access to conventional care in proximity to the place of residence [20, 29]. CAM can play a significant role for residents in remote or geographically isolated areas. The scant evidence that is available suggests that CAM use and practice in rural areas occurs within a multifaceted structure of social relations and cultural structures [20].

According to a study in Turkey, the use of prayer and herbal remedies was more prevalent in rural areas due to increased religiosity and the economic benefits of gathering herbs from the natural environment [37]. However, more studies have been carried out in urban environments, and there is a need for studies in rural areas [20].

### *Strengths and Limitations*

We saw no obvious signs of self-selection bias (i.e., that CAM users would be more willing to participate than nonusers) because the age and gender distributions of those who could not or chose not to respond were analysed and yielded distributions that were very similar to the respondent group. While this does not rule out sampling bias, the age and gender distributions are comparable. Although we acknowledge that a 59% response rate may be low, the authors also note that this response rate aligns with previous studies.

One weakness of the study is the selection of patients, who are all from a small region of Sweden and may not be representative of the entire country. Also, the distinction between small and large towns, as well as the borders

between the studied regions, can be perceived as arbitrary. Another weakness is that the study cannot further characterize the patients living in different residence settings. The absence of total consistency in the age group categorization is another potential limitation of the study.

## **Conclusion**

It is important that healthcare providers ask patients about all of their health-seeking behaviours [20, 38]. More studies regarding the use of CAM in rural areas and the cultural factors that could influence the use of CAM in these areas are needed. The ability to highlight the fact that CAM use may be more common in certain rural areas is important from a social perspective, especially in a centralized society where distances to healthcare facilities can be considerable.

## **Acknowledgments**

We would like to thank all of our patients, the palliative home care team in Region Gävleborg and the Department of Oncology at Gävle Hospital for their participation and help with recruitment.

## **Statement of Ethics**

This study was approved by the Regional Ethical Review Board in Uppsala (Dnr. 2016/360). Informed consent was obtained from study participants for the completion of the questionnaire; all methods were performed in accordance with the relevant guidelines and regulations.

## **Conflict of Interest Statement**

The authors have no conflicts of interest to declare.

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## **Author Contributions**

M.K.: conceptualization, methodology, resources, writing – original draft, visualization, and writing – review and editing. J.G.: data curation and formal analysis. G.H. and S.B.: conceptualization, methodology, and writing – review and editing. R.R.E.: writing – review and editing. M.B.: conceptualization, methodology, writing – review and editing, and supervision. All authors have read and approved the manuscript.

## **Data Availability Statement**

Due to privacy regulations, the data generated and analysed are not available to the public. An adapted version is available from the corresponding author upon reasonable request.

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