



Higher overall admittance of immigrants to specialised palliative care in Denmark: a nationwide register-based study of 99,624 patients with cancer

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Abstract

Background The population of immigrants in Europe is ageing. Accordingly, the number of immigrants with life-threatening diseases and need for specialised palliative care will increase. In Europe, immigrants' admittance to specialised palliative care is not well explored.

Aim To investigate whether country of origin was associated with admittance to (I) palliative care team/unit, (II) hospice, and/or (III) specialised palliative care, overall (i.e. palliative care team/unit and/or hospice).

Design Data sources for the population cohort study were the Danish Palliative Care Database and several nationwide registers. We investigated the associations between country of origin and admittance to specialised palliative care, overall, and to type of palliative care using logistic regression analyses.

Setting/participants.

In 2010–2016, 104,775 cancer patients died in Denmark: 96% were born in Denmark, 2% in other Western countries, and 2% in non-Western countries.

Results Overall admittance to specialised palliative care was higher for immigrants from other Western (OR = 1.13; 95%CI: 1.03–1.24) and non-Western countries (OR = 1.22; 95%CI: 1.08–1.37) than for the majority population. Similar results were found for admittance to palliative care teams. No difference in admittance to hospice was found for immigrants from other Western countries (OR = 1.04; 95%CI: 0.93–1.16) compared to the majority population, while lower admittance was found for non-Western immigrants (OR = 0.70; 95%CI: 0.60–0.81).

Conclusion Admittance to specialised palliative care was higher for immigrants than for the majority population as higher admittance to palliative care teams for non-Western immigrants more than compensated for the lower hospice admittance. This may reflect a combination of larger needs and that hospital-based and home-based services are perceived as preferable by immigrants.

Keywords Immigrants · Specialised palliative care · Nationwide register · Cancer

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Introduction

Ethnic minorities' access to health care has come under increasing scrutiny during the last few years [1, 2]. Higher mortality from COVID-19 and inequality in palliative care have been found for ethnic minority groups during the COVID-19 pandemic [1, 3, 4]. Furthermore, there have been movements like Black Lives Matter [2]. In European countries, the population of immigrants (i.e. refugees and migrants who at a point in their lives have migrated to another country) is ageing [5]. Accordingly, the number of immigrants with chronic and life-threatening diseases and a need for specialised palliative care will increase.

Specialised palliative care has been found to have positive effects on patients, e.g. higher quality of life and lower symptom burden, and some studies have even found longer survival [6, 7]. Specialised palliative care for immigrants has been studied mainly in the USA in relation to hospice admittance [8, 9], whereas it has rarely been studied in a European context and to our knowledge never in a nationwide study. The only European study investigating admittance to palliative care teams was a small Danish study which found higher admittance for immigrants and descendants compared to the majority population [10]. However, the majority of the European studies investigating admittance to specialised palliative care overall (including different specialised palliative care services) or specifically to hospice found lower admittance for ethnic minorities compared to the majority population [11–15], except for a Scottish study where no differences were found [16]. Thus, the previous European studies found lower admittance to hospice, but higher admittance to palliative care teams for minorities than for the majority population.

Likewise, we have previously found that the association between different factors and admittance to specialised palliative care was dependent on the type of service, e.g. we found higher admittance to hospice for women, and lower admittance to palliative care teams, but higher admittance to hospice for patients living alone [17, 18]. Furthermore, a white paper from the National Institute on Aging (USA) points out that a priority for future research should be to investigate disparities in settings other than hospice [8]. Therefore, besides investigating possible differences for immigrants compared to the majority population regarding admittance to specialised palliative care overall, it also seems central to also investigate admittance to specific types of units.

In Denmark, we have unique nationwide high-quality registers that include data on admittance to palliative care teams/units and hospice [19]. The high completeness of the registers makes them ideal repositories of information

to address whether the country of origin of patients with cancer is associated with admittance to (I) hospital-based palliative care team/unit, (II) hospice, and/or (III) specialised palliative care, i.e. hospital-based palliative care team/unit and/or hospice.

Methods and materials

Setting

Of Denmark's 5.8 million inhabitants [20], approximately 10% are immigrants, and around 40,000 of these immigrants are 60+ years old [21]. More than fifty percent (58%) of the immigrants are from non-Western countries [22].

The vast majority of Danish health care, including specialised palliative care, is tax-financed. Specialised palliative care is provided by multidisciplinary teams at hospitals (2016, $N=24$) and free-standing hospices (2016, $N=19$). Hospital-based palliative care teams/units mainly provide palliative care for outpatients, while most patients at hospices are inpatients. The Danish-specialised palliative care capacity is half the size recommended by the European Association for Palliative Care [23–25].

Data sources

The study is based on a population cohort design, and the data sources for this study were the nationwide database, the Danish Palliative Care Database [19], and the nationwide registers, the Danish Register of Causes of Death [26], Cancer Registry [27], Danish Civil Registration System [28], Population's Education Register [29], and the Income Statistics Register [30] (Table 1). The completeness of the registers is close to 100%, e.g. 99% for the Danish Palliative Care Database and Danish

Table 1 The registers and related data used in the study

Register	Variables
Danish Palliative Care Database	Admittance to specialised palliative care overall Admittance to hospice Admittance to palliative care team/unit
Danish Register of Causes of Death	Cause of death (cancer diagnosis)
Cancer Registry	Cancer diagnosis
Danish Civil Registration System	Sex Age Geographic region Cohabitation status Country of origin
Population's Education Register	Formal education
the Income Statistics Register	Income

Register of Causes of Death [19, 26]. The completeness of the Population's Education Register is high for Danish-born (97%), but slightly lower for immigrants (85–90% for birth cohorts 1945–1990) because education acquired outside Denmark is not automatically included in the register [29].

Study population

Persons 18+ years old who died from cancer from 1 January 2010 to 31 December 2016 were identified in the Danish Register of Causes of Death. Cancer registration in the Danish Register of Causes of Death was compared with the Cancer Registry [27]. Persons who also had a cancer registration in the Cancer Registry were included. Individuals were excluded if there was missing data on country of origin, geographic region, cohabitation status, and income (Fig. 1).

Variables

Outcome

Admittance to specialised palliative care was defined as being an out- or inpatient in a specialised palliative care unit or having a specialised palliative care consultation while being an inpatient in a non-specialised palliative care department.

Admittance to specialised palliative care was measured as:

Overall admittance to specialised palliative care: admitted to hospital-based palliative care team/unit and/or hospice.

Type-specific admission:

Admitted to hospital-based palliative care team/unit (mainly outpatients)

Admitted to hospice (mainly inpatients)

Patients admitted to both types of institutions will be included in both groups.

Exposure

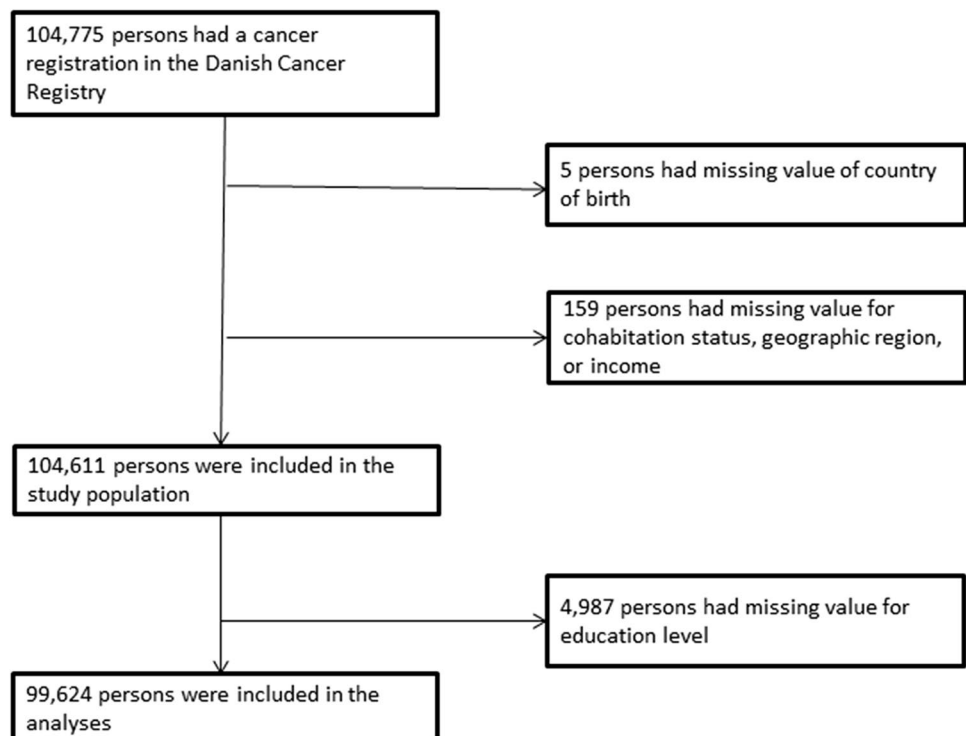
Persons were categorised by country of origin (categories according to official terminology in Statistics Denmark):

- Majority population: persons born in Denmark or persons—regardless of place of birth—where at least one parent is a Danish citizen and also born in Denmark
- Immigrants from Western countries including the 26 EU countries, UK, Andorra, Iceland, Lichtenstein, Monaco, Norway, San Marino, Schweiz, Vatican State, Canada, USA, Australia, and New Zealand
- Immigrants from non-Western countries (all other countries)

Other variables

Confounding variables: sex; age; cancer diagnosis (ICD-10) (with a few exceptions, corresponding to the main groups in the Cancer Registry); geographic region; cohabitation

Fig. 1 Flowchart for sampling the study population



status (cohabiting, married but not living together, divorced, widow/widower, never married) [18]; education level (lower secondary school, skilled worker, short theoretical (1–2 years after Certificate of Upper secondary School leaving Examination, e.g. business academy), long theoretical (3–4 years after Certificate of Upper secondary School leaving Examination, e.g. university college), academic (5+ years after Certificate of Upper secondary School leaving Examination, e.g. university) [31, 32]); family equalised disposable income (is the household disposable income divided by the number of members of the household converted into equalised adults) divided into quartiles (Q1: $\leq 21,029$ EUR/year, Q2: $> 21,029$ – $24,785$ EUR/year, Q3: $> 24,785$ – $32,842$ EUR/year, Q4: $> 32,842$ EUR/year); and year of death (2010–2016). Geographic region, cohabitation status income, and formal education were assessed the year before death.

Statistical analyses

Country of origin (majority population, immigrants from Western or non-Western countries) was tabulated according to the confounders. The association between country of origin and admittance to specialised palliative care, overall and type-specific, was investigated using unadjusted and adjusted logistic regression analyses including all the confounders (sex, age, cancer diagnosis, geographic region, cohabitation status, formal education, income, and year of death).

Sensitivity analyses were conducted in the logistic regression analyses including patients with missing data on education level in their own group and in the group of persons with the lowest and highest education level, respectively.

The results were reported as odds ratios (OR) with 95% confidence intervals (CI). The analyses were run in SAS statistical software (9.4).

Results

In the study period, 104,775 individuals died from cancer (Fig. 1). The descriptive results showed a markedly lower mean age (64 vs 73 years), a higher proportion of digestive cancers, and a lower proportion of prostate cancer among immigrants from non-Western countries compared to the majority population (Table 2). A markedly higher proportion of immigrants were living in the Capital Region of Denmark than was the case for the majority population (Western countries 42% and non-Western countries 50% vs 27% majority population). Immigrants from non-Western countries were more often cohabiting and less often widows/widowers than

the majority population. A higher proportion of immigrants from other Western and non-Western countries had a long theoretical and academic education, e.g. 21% of immigrants from other Western and 19% from non-Western countries had a long theoretical education compared with the majority population (12%). A higher proportion of immigrants, particularly from non-Western countries, had missing data about education (4% of the majority population, 14% from Western countries, 23% from non-Western countries). Fifty-four percent of the immigrants from non-Western countries were in the lowest income quartile and 12% were in the highest compared with 24% and 25% of the majority population. The proportion dying from cancer in the study period increased for patients from non-Western countries (12–18%) (Table 2).

In the logistic regression analyses, 99,624 patients were included (excluding 4987 patients (5%) with missing values on education level). Compared to the included population, the excluded population had a higher proportion of patients from other Western countries (2% vs 7%) and from non-Western countries (1% vs 8%). Furthermore, the excluded group of patients was older (84 vs 72 years old), a lower proportion had cancer in the respiratory system (14% vs 24%), was more often widow/widower (50% vs 23%), was in the lowest income quartile (39% vs 24%), and the year of death was more often 2010 and 2011 (19–20% vs. 14%).

In the unadjusted and adjusted logistic regression analysis, the odds of overall admittance to specialised palliative care were found to be higher for immigrants (from other Western and non-Western countries) than for the majority population, highest for patients from non-Western countries (adjusted OR = 1.22 [95%CI; 1.08–1.37]). Analysis of type-specific admittance showed that immigrants (from other Western and non-Western countries) had higher admittance to a hospital-based palliative care team/unit than the majority population, and non-Western immigrants had lower admittance to hospice (OR = 0.70 [95%CI; 0.60–0.81]) (Table 3).

The results from the sensitivity analyses including those with missing data on the educational level in one group, as having lower secondary school or an academic education, respectively, did not influence the conclusion (Table 4). The biggest difference was seen for admittance to the palliative care team/unit for patients from non-Western countries (OR differed between = 1.54–1.69 (included missing data on education in a separate group).

Discussion

The aim of this study was to investigate whether the country of origin was associated with admittance to specialised palliative care overall and to type-specific specialised

Table 2 Characteristics of the study population in relation to country of origin

	Total	Country of origin		
		Majority population	Immigrants from Western countries	Immigrants from non-Western countries
Total population, <i>n</i> (%)	104,611 (100)	100,558 (96)	2378 (2)	1675 (2)
Sex, <i>n</i> (%)	54,951 (53)	52,896 (53)	1124 (47)	931 (56)
Male	49,660 (47)	47,662 (47)	1254 (53)	744 (44)
Female				
Age (years)	73 (12)	73 (12)	72 (12)	64 (13)
Mean (SD) [‡]	3807 (4)	3488 (3)	101 (4)	218 (13)
18–49, <i>n</i> (%)	10,094 (10)	9477 (9)	225 (9)	392 (23)
50–59	25,659 (25)	24,567 (24)	654 (28)	438 (26)
60–69	33,533 (32)	32,364 (32)	756 (32)	413 (25)
70–79	31,518 (30)	30,662 (30)	642 (27)	214 (13)
80+				
Diagnosis (cancer site), <i>n</i> (%)	2425 (2)	2324 (2)	64 (3)	37 (2)
Oral cavity, nasopharyngeal (etc.) (C00–C14)	13,837 (13)	13,205 (13)	331 (14)	301 (18)
Digestive system (C15–17 & C22 + 25)	12,852 (12)	12,409 (12)	271 (11)	172 (10)
Colorectal (C18–C20)	24,887 (24)	23,933 (24)	566 (24)	388 (23)
Respiratory system (C32–34)	1867 (2)	1827 (2)	23 (1)	17 (1)
Melanoma skin cancer (C43)	681 (1)	647 (1)	12 (1)	22 (1)
Sarcoma (C46–C49)	8265 (8)	7910 (8)	211 (9)	144 (9)
Breast (C50)	4549 (4)	4331 (4)	124 (5)	94 (6)
Female genital organs (C53–55 & C56, C570–C574)	8195 (8)	7970 (8)	157 (7)	68 (4)
Prostate (C61)	5457 (5)	5268 (5)	114 (5)	75 (5)
Urinary tract (C64–C67)	3318 (3)	3149 (3)	91 (4)	78 (5)
Brain/CNS (C70–C71, C751–C753)*	6499 (6)	6216 (6)	158 (7)	125 (7)
Lymphoid & haematopoietic tissue (C81–85 & C90–95)	11,779 (11)	11,369 (11)	256 (11)	154 (9)
Unknown or other cancer (all other C codes)				
Geographic region, <i>n</i> (%)	17,657 (17)	17,167 (17)	313 (13)	177 (11)
Region Zealand	11,604 (11)	11,355 (11)	169 (7)	80 (5)
North Denmark Region	22,543 (22)	21,910 (22)	363 (15)	270 (16)
Central Denmark Region	23,640 (23)	22,801 (23)	543 (23)	296 (18)
Region of Southern Denmark	29,167 (28)	27,325 (27)	990 (42)	852 (51)
Capital Region of Denmark				
Cohabitation status, <i>n</i> (%)	55,175 (53)	52,977 (53)	1184 (50)	1014 (61)
Cohabiting	2837 (3)	2584 (3)	113 (5)	140 (8)
Married, but not living together	13,145 (13)	12,522 (12)	403 (17)	220 (13)
Divorced	25,465 (24)	24,710 (25)	531 (22)	224 (13)
Widow/widower	7989 (8)	7765 (8)	147 (6)	77 (5)
Never married				
Education level (missing = 4987, 5%), <i>n</i> (%)	45,399 (46)	44,307 (46)	568 (28)	524 (41)
Lower secondary school	35,927 (36)	34,804 (36)	762 (37)	361 (28)
Skilled worker	2513 (3)	2350 (2)	101 (5)	62 (5)
Short theoretical (1–2 years after CUSE [§])	12,110 (12)	11,446 (12)	425 (21)	239 (19)
Long theoretical (3–4 years after CUSE [§])	3675 (4)	3386 (4)	188 (9)	101 (8)
Academic (5+ years after CUSE [§])				
Family income, quartiles [#] , <i>n</i> (%)	26,151 (25)	24,515 (24)	726 (31)	910 (54)
Q1 (lowest)	26,154 (25)	25,375 (25)	468 (20)	311 (19)
Q2	26,154 (25)	25,357 (25)	543 (23)	254 (15)
Q3	26,152 (25)	25,311 (25)	641 (27)	200 (12)
Q4 (highest)				
Year of death, <i>n</i> (%)	14,711 (14)	14,189 (14)	316 (13)	206 (12)
2010	14,951 (14)	14,438 (14)	301 (13)	212 (13)
2011	15,125 (15)	14,538 (15)	365 (15)	222 (13)
2012	14,805 (14)	14,229 (14)	339 (14)	236 (14)
2013	14,994 (14)	14,413 (14)	331 (14)	250 (15)
2014	14,999 (14)	14,396 (14)	352 (15)	251 (15)
2015	15,027 (14)	14,355 (14)	374 (16)	298 (18)
2016				

[‡]SD Standard Deviation

*Including the following D-codes: D32, D42, D330–332, D352–354, D430–432, D443–445, D333–339, and D433–439

[§]CUSE Certificate of Upper secondary School leaving Examination[#]Q1: ≤ 21,029 EUR/year, Q2: > 21,029–24,785 EUR/year, Q3: > 24,785–32,842 EUR/year, Q4: > 32,842 EUR/year

Table 3 Overall and type-specific admittance to specialised palliative care for cancer patients in relation to country of origin: unadjusted and adjusted percentages and odds ratios unadjusted and adjusted

N=99,624	Overall admittance % and OR (95% CI)			Type-specific admittance % and OR (95% CI)					
				Hospital-based palliative care team/unit		Hospice			
Country of origin	%	Unadjusted	Adjusted*	%	Unadjusted	Adjusted*	%	Unadjusted	Adjusted*
Majority population	42	1 (ref)	1 (ref)	30	1 (ref)	1 (ref)	20	1 (ref)	1 (ref)
Immigrants from Western countries	46	1.20 (1.10–1.31)	1.13 (1.03–1.24)	33	1.14 (1.04–1.25)	1.18 (1.07–1.31)	23	1.18 (1.07–1.31)	1.04 (0.93–1.16)
Immigrants from non-Western countries	53	1.58 (1.41–1.76)	1.22 (1.08–1.37)	43	1.80 (1.61–2.01)	1.54 (1.36–1.74)	18	0.86 (0.74–0.99)	0.70 (0.60–0.81)

*Adjusted sex, age, diagnosis, geographic region, cohabitation status, education, income, and year of death.

OR odds ratio.

CI confidence interval.

Table 4 Sensitivity analyses of overall and type-specific admittance to specialised palliative care for cancer patients in relation to country of origin, adjusted for sex, age, diagnosis, geographic region, cohabitation status, education, income, and year of death including those with missing data on education in one separate group, in the none formal education group, and in the academic education group

N=104,611	Overall admittance OR (95% CI)	Type-specific admittance OR (95% CI)	
		Hospital-based palliative care team/ unit	Hospice
Separate group*			
Country of origin:			
Majority population	1 (ref)	1 (ref)	1 (ref)
Immigrants from Western countries	1.20 (1.10–1.31)	1.20 (1.09–1.32)	1.10 (0.99–1.21)
Immigrants from non-Western countries	1.31 (1.18–1.46)	1.69 (1.51–1.89)	0.69 (0.61–0.80)
Lower secondary school**			
Country of origin:			
Majority population	1 (ref)	1 (ref)	1 (ref)
Immigrants from Western countries	1.16 (1.06–1.27)	1.17 (1.06–1.28)	1.07 (0.97–1.19)
Immigrants from non-Western countries	1.23 (1.11–1.37)	1.60 (1.44–1.79)	0.67 (0.59–0.77)
Academic (5+ years after CUSE§)***			
Country of origin:			
Majority population	1 (ref)	1 (ref)	1 (ref)
Immigrants from Western countries	1.18 (1.08–1.29)	1.19 (1.08–1.31)	1.08 (0.98–1.19)
Immigrants from non-Western countries	1.25 (1.12–1.39)	1.62 (1.45–1.81)	0.66 (0.58–0.76)

*Patients with missing data on education were included as a separate group.

**Patients with missing data on education were included in 'no formal education'.

***Patients with missing data on education were included in 'academic education'.

§CUSE Certificate of Upper secondary School leaving Examination

OR odds ratio.

CI confidence interval.

palliative care: palliative care team/unit and hospice. We found that immigrants, especially from non-Western countries, had higher overall admittance to specialised palliative care, in particular palliative care teams/units, but a lower admittance to hospice than the majority population.

Comparison with the literature

Few other studies have investigated admittance to specialised palliative care in relation to the country of origin [11, 12, 15, 33, 34] or immigration status [10]. In most studies in

this field, admittance to specialised palliative care has been investigated in relation to ethnicity [13, 35–50].

In contrast to the findings in the present study, two German studies found that the majority population were more likely to access specialised palliative care than immigrants [11, 12]. Our findings are supported by an Australian study which found that people born in the UK and Europe were more likely to be admitted to palliative care than Australian born [34].

Similar to our study, another Danish study of admittance to a *palliative care team* found that immigrants were more likely to be admitted to this service than the majority population [10]. A similar result was found in one of the studies investigating admittance to a *palliative care consultation* [48], while two other studies found no association [37, 39].

In relation to *hospice*, most studies have found higher admittance rates to hospice for the majority population, supporting the results from this study [13, 15, 38, 40, 42, 43, 45, 46, 49, 50]. Few studies found no association [16, 36, 41, 44] or lower admittance for the majority population [33, 35, 47].

Possible explanations

Higher admittance to palliative care team/unit for immigrants may reflect a greater need for hospital admittance and therefore a fair difference in admittance between immigrants and the majority population. Furthermore, the higher admittance to palliative care team/unit and lower admittance to hospice for immigrants could be explained by a culture where the family takes care of the older family members ('the generation contract') [51–53]. A palliative care team visiting patients in their homes may be more suitable in a culture where there is a tradition (for the family or immigrants from the same country) that the family takes care of sick family members at home [54, 55]. However, the literature about the place of death does not show a higher proportion of immigrants dying at home [15, 16, 56], even though they, similar to the native population, would prefer to die at home [57, 58]. Furthermore, the lower admittance to hospice for immigrants from non-Western countries could be explained by religion, as the hospices in Denmark historically have had a relation to Christianity [59].

Danish studies investigating immigrants and their admittance to the health care system in general found no difference in relation to free-of-charge health care services [60, 61], but lower use of dentists, who are not free of charge and have private practices [57]. A study investigating face-to-face contacts with general practitioners in the last 90 days of life found more face-to-face contacts for immigrants than non-immigrants, whereas no difference in home visits was found [62]. It is possible that even though hospices are free of charge like the main part of the health care system, the (physical and organisational) separation in small institutions

outside the rest of the health care system (with the main focus on the treatment of the disease) is important for access.

Knowledge is another possible explanation for the findings in this study. Studies of patients with cancer and other diseases have shown lower awareness of palliative care and related services in ethnic minority groups [63, 64]. A Danish study found low knowledge about hospice among older immigrants and their caregivers [52]. Immigrants may come from countries where hospice does not exist, and the first step to requesting hospice is to know that hospice exists and for whom. Communication about this topic can be difficult for the patients and the health care professionals because of language and cultural barriers [53, 55], and studies have found that less information about hospice is given to immigrants [53, 65], which could explain the lower admittance to hospice. Additionally, it is possible that a referral to a palliative care team is less complicated (less explanation is needed) than a referral to a hospice placed outside the hospital. Also, a well-established contact to a palliative care team may manage the symptoms and problems of the patients and their family in their homes so well that the need for hospice decreases. However, the pattern was not found for immigrants from other Western countries. Furthermore, the policy and restrictions introduced in health care including palliative care during the COVID-19 pandemic have shown the importance of not only factors in relation to the patient and caregivers but also in the environment of palliative care in order to accommodate the needs of ethnic minority groups, e.g. in relation to the possibility to visit the patient and meet religious and cultural needs [4].

Finally, the expectations of specialised palliative care may influence admittance and preferences for admittance. A study from the UK of older people from the majority population and Chinese people found that for the majority population, hospice was associated with the 'good death', which was not the case for the Chinese people, who saw hospice as a place with limited opportunities for a good death [66]. The 'good death' may not be understood in the same way across different minority groups [67]. More research is required to elucidate how this is comprehended and how services may need to respond accordingly [68].

Strengths and limitations

The major strengths of the study are the high validity and, except for education (discussed later), high completeness of data and the unique possibility to merge several nationwide registers with data at the patient level. The large size of the study population enabled us to investigate immigrants in relation to specialised palliative care overall and to type-specific care.

A limitation of the study is that the exposure (country of origin) was grouped into Denmark, other Western countries, and non-Western countries. The group of non-Western countries included very different countries from Africa, Asia, and the Middle East, thereby masking differences between these

non-Western countries. With the presently available data, a country-specific analysis is not possible, and therefore, we used the classification of immigrants developed by Statistic Denmark and used in official statistics in Denmark [21]. Furthermore, in relation to exposure, it could have been relevant to use other measures of migration than the country of origin, e.g. the language spoken at home or a subjective measure about how the person identifies him/herself. But such information is not included in the registers and is therefore not included in this study. Another limitation is that 5% had missing data on education. The patients excluded from the analyses due to missing information differed in age and income, but in the sensitivity analyses, the conclusion was not affected by how the missing data was handled. Today, the need for specialised palliative care is unknown in the registers (symptoms and problems are only known for patients admitted to specialised palliative care), and it is therefore not possible to take the need for specialised palliative care into account in a register-based study like this. With the increasing focus on patient-reported outcomes in the health care system, it will in the future hopefully be possible to include information about the need for specialised palliative care based on patient-reported outcomes.

What does this study add?

This study adds new knowledge about admittance to specialised palliative care in relation to the country of origin in a European context. This topic is rarely investigated, and knowledge is scarce about admittance to palliative care team/units, one of the priorities in the White Paper of the National Institute on Aging (2013) [8]. It shows further the importance of studying overall admittance to specialised palliative care, including all types of specialised palliative care units because differences in admittance were seen for the different types of specialised palliative care institutions.

Implications

The implications of the present study are that health care professionals have an important duty to ensure that immigrants from non-Western countries are informed about hospice so that they have the same knowledge about hospice as do non-immigrants. Furthermore, it is important that information material about hospice is available in foreign languages.

Future research

Further investigation of immigrants is needed to understand the difference found in this study, and whether the association reflects cultural differences in preferences, needs, values, etc. It would therefore be relevant to study the expectations of specialised palliative care for immigrants in different settings. Furthermore, it may be relevant to study whether (and

how) the country of origin affects the health care professionals (especially physicians) in deciding which type of specialised palliative care unit the patient should be referred to.

Conclusion

This study found higher overall admittance to specialised palliative care for immigrants. Immigrants from non-Western countries had higher admittance to palliative care team that more than compensated for the lower admittance to hospice. This may reflect a combination of larger needs and that hospital-based and home-based services are perceived as preferable by immigrants. Investigating admittance to specialised palliative care for immigrants should include all types of specialised palliative care units in the country, as this study has shown differences in admittance related to the two types of specialised palliative care units (palliative care teams and hospice) investigated in this study.

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Data availability The data used in this study are available at Statistics Denmark and Danish Palliative Care Database. Restrictions apply to the availability of these data.

Declarations

Ethics approval and consent to participate According to Danish law, register-based studies do not require ethics committee approval. The study was approved by The Danish Data Protection Agency (BBH-2012-06, I-Suite nr.: 01637) and The Danish Clinical Registries (RKKP) (DPD-2017-11-30). Consent to participate was not applicable.

Consent for publication Not applicable.

Competing interests The authors declare no competing interests.

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