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Features of Breast Cancer in Iranian-born Migrant Women Treated in Australia

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ABSTRACT

Background: While there is much information available about breast cancer in Australia overall, less is known about breast cancer in immigrant women and specifically Iranian-born women. Understanding this group is important to provide appropriate screening, treatment and support interventions. The aim of this study was to describe breast cancer presentation, tumour and treatment characteristics in Iranian-born women in Australia.

Methods: Women were eligible for this retrospective audit if treated for breast malignancy with country of birth recorded. Demographic, tumour and surgical data were extracted and analysed. Data for Iranian-born women were compared to data for Australian-born (comparison group 1) and women born in countries other than Australia or Iran (comparison group 2, referred to as 'other').

Results: 2086 women were eligible: Iranian-born n=27, Australian-born n=894 and Other n=1165. Iranian-born women were younger, mean age of 53.9 (five years younger in overall mean, SD 11.98, F=3.171, p=0.042). Iranian-born women were significantly less likely to present with a screen-detected cancer (X2= 11.481, p=0.003) and more likely to have a high-grade cancer (X2=14.383, p=0.006). There was no difference in mastectomy rate (X2=1.698, p=0.428).

Conclusions: Iranian-born women treated for breast cancer in Australia were younger, had higher-grade tumours and were less likely to have a screen-detected cancer than Australian-born women or women born in other countries. Strategies to encourage screening participation in Iranian-born women are required. Support for these women is required as they are more likely to receive toxic treatments (chemotherapy and extended adjuvant endocrine therapy) due to younger age and higher grade tumours.

Introduction

Breast cancer is the most common cancer affecting females in most countries around the world, including Australia and Iran.[1-3] While there is much information available about breast cancer in Australia overall, less is known about breast cancer in immigrant women. Australia has a population mammography screening program that is targeted to women aged 50–74. Women can attend on request from the age of 40.[4] Participation in the screening program is lower among the immigrant population compared to Australian-born women, possibly due to cultural and language barriers.[5] In addition to fewer screen-detected cancer than Australian-born women, there is some evidence to suggest that other aspects of breast cancer patterns vary among different cultural groups in Australia. For example, women born in Arabic-speaking countries are younger than Australian-born women and they are

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more likely to have high-grade and HER2 positive cancer.[6]

Western Sydney, the setting for this study, has a very diverse population. Over 40% of the population has a country of birth other than Australia and 45% speak a language other than English at home (twice the New South Wales state average).[7] There is no single country or region of birth making up the population. Immigrants to Sydney come from many different Asian and Middle Eastern countries as well as European countries and New Zealand. The number of immigrants settling in Western Sydney increased by 21% over the five-year period from 2011 to 2016. Iranian-born women make up a significant proportion of this population, with an estimated total of 12,500 Iranian-born people living in Western Sydney.[7,8] In Australia overall, there are more than 58,000 Iranian-born people and the population increased by 69% during the five year period between 2011 and 2016.[9] Understanding breast cancer in the Iranian-born population is important in order to plan screening interventions and to provide culturally appropriate support to women and their families when breast cancer is diagnosed.

The aim of this study was to describe breast cancer presentation, tumour and treatment characteristics in Iranian-born women treated in Western Sydney. A further aim was to compare the features in Iranian-born women to those for women born in Australia or other (non-Australian, non-Iranian) countries.

Methods

This study was a retrospective audit of a prospectively maintained database at the major referral hospital in Western Sydney. The database was searched to identify cases that met eligibility criteria: female, aged over 18, treated for DCIS or invasive breast cancer and born in Iran. Cases could not be included where country of birth was not recorded and cases were excluded when key pathological factors such as tumour type, size and grade were missing.

Demographic data were extracted (patient age, country of birth, religion, marital status, postcode of residence). Tumour and surgical data were extracted (method of detection, histological type, size, grade, and receptor status of cancer as well as breast conservation vs mastectomy, re-excision, breast reconstruction and contralateral prophylactic surgery).

Corresponding data were gathered for Australian-born women (comparison group 1) and for women born in countries other than Australia or Iran (comparison group 2, referred to as 'other') who were treated during the same time period. Area of disadvantage decile was included in demographic data and this was determined using Australian government postcode tables based on census data.[10]

Analysis was conducted using SPSS Statistics Version 24. Descriptive statistics were used to summarise each factor in each of the three groups. Chi-square analysis was performed to evaluate differences between groups. A p-value ≤0.05 was considered significant.

Results

Institutional ethics approval was obtained (Western Sydney HREC, 2019/ETH10761).

There were 2086 eligible cases identified: women treated for DCIS or invasive breast cancer (2011–2017) with country of birth information available. They were born in Iran (n=27, 1.3%), Australia (n=894, 42.9%), and other countries (n=1165, 55.8%). Eighty-one different countries of birth were noted, and Iran was the 12th most common (Table 1).

Table 1. Country of birth of women treated for DCIS or invasive breast cancer (N=2086)

Country	N	%
Australia	894	42.9
Philippines	139	6.7
China	134	6.4
United Kingdom	109	5.2
Lebanon	85	4.1
India	63	3
New Zealand	46	2.2
Fiji	34	1.6
Sri Lanka	32	1.5
Malta	30	1.4
Hong Kong	28	1.3
Iran	27	1.3
South Korea	25	1.2
Turkey	25	1.2
Italy	24	1.2
Iraq	22	1.1
Vietnam	22	1.1
Croatia	21	1
Malaysia	21	1
Afghanistan	20	1
Other	285	12.2
TOTAL	2086	100

Demographics

Patient demographics are shown in Table 2. The mean age for the cohort overall was 58.6 years and Iranian-born women were significantly younger, mean 53.9 years (SD 11.98, F=3.171, p=0.042). In the Iranian-born group, 14.8% were over the age of 65 and none over the age of 80, compared to 70.7% and 29.3% for the cohort overall (X^2=17.299, p=0.027). There was no difference in menopausal status between the three groups (X^2=2.735, p=0.603). 59.3% of Iranian-born women nominated English as their preferred language and 33.3% nominated Farsi. Iranian-born women, categorised by postcode of

Table 2. Demographic data for women born in Iran, Australia and other countries (N=2086 women)

Characteristic		Iran (N=27)		Australia (N=894)		Other country (N=1165)		Total (N=2086)		X^2 value*	P
		N	%	N	%	N	%	N	%		
Age	Mean	53.9 yrs	(SD 12.44)	59.1 yrs	(SD 12.44)	58.3 yrs	(SD 11.63)	58.6 yrs	(SD 11.98)	F=3.171	0.042
	Age range	35 to 71 yrs		21 to 94 yrs		20 to 94 yrs		20 to 94 yrs			
Age Group	20-35	1	3.7%	30	3.4%	23	2.0%	54	2.6%		
	36-50	9	33.3%	195	21.8%	280	24.0%	484	23.2%		
	51-65	13	48.1%	380	42.5%	544	46.7%	937	44.9%		
	66-80	4	14.8%	247	27.6%	285	24.5%	536	25.7%		
	>80	0	0.0%	42	4.7%	33	2.8%	75	3.6%		
	Total	27	100.0%	894	100.0%	1165	100.0%	2086	100.0%	17.299	0.027
Preferred language	English	16	59.3%	886	99.1%	758	65.1%	1660	79.6%		
	Farsi	9	33.3%	0	0.0%	6	0.5%	15	0.7%		
	Arabic	0	0.0%	5	0.6%	57	4.9%	62	3.0%		
	Other	1	3.7%	3	0.3%	329	28.2%	333	16.0%		
	Unknown	1	3.7%	0	0.0%	15	1.3%	16	0.8%		
	Total	27	100.0%	894	100.0%	1165	100.0%	2086	100.0%	777.666	<0.001
Religion	Anglican	0	0.0%	248	27.7%	48	4.1%	296	14.2%		
	Catholic	1	3.7%	298	33.3%	362	31.1%	661	31.7%		
	Other Christian	5	18.5%	159	17.8%	271	23.3%	435	20.9%		
	Muslim	6	22.2%	4	0.4%	98	8.4%	108	5.2%		
	Hindu	0	0.0%	0	0.0%	63	5.4%	63	3.0%		
	Buddhist	0	0.0%	4	0.4%	63	5.4%	67	3.2%		
	Sikh	0	0.0%	0	0.0%	11	0.9%	11	0.5%		
	Atheist/Agnostic	0	0.0%	28	3.1%	24	2.1%	52	2.5%		
	None	3	11.1%	86	9.6%	134	11.5%	223	10.7%		
	Jewish	0	0.0%	0	0.0%	1	0.1%	1	0.0%		
	Other	5	18.5%	3	0.3%	3	0.3%	11	0.5%		
	Unknown	7	25.9%	64	7.2%	87	7.5%	158	7.6%		
	Total	27	100.0%	894	100.0%	1165	100.0%	2086	100.0%	612.256	<0.001
Marital status	Married	15	55.6%	515	57.6%	801	68.8%	1331	63.8%		
	Defacto	1	3.7%	39	4.4%	27	2.3%	67	3.2%		
	Divorced	6	22.2%	120	13.4%	92	7.9%	218	10.5%		
	Never Married	0	0.0%	71	7.9%	47	4.0%	118	5.7%		
	Separated	2	7.4%	37	4.1%	52	4.5%	91	4.4%		
	Single	0	0.0%	13	1.5%	10	0.9%	23	1.1%		
	Widowed	3	11.1%	92	10.3%	127	10.9%	222	10.6%		
	Unknown	0	0.0%	7	0.8%	9	0.8%	16	0.8%		
	Total	27	100.0%	894	100.0%	1165	100.0%	2086	100.0%	53.386	<0.001
Area of disadvantage decile*	Group 1-2	3	11.1%	178	20.0%	296	25.4%	477	22.9%		
	Group 3-4	3	11.1%	124	13.9%	155	13.3%	282	13.5%		
	Group 5-6	4	14.8%	177	19.8%	171	14.7%	352	16.9%		
	Group 7-8	9	33.3%	213	23.9%	262	22.5%	484	23.2%		
	Group 9-10	8	29.6%	200	22.4%	281	24.1%	489	23.5%		
	Unknown	0	0.0%	0	0.0%	0	0.0%	0	0.0%		
	Total	27	100.0%	892	100.0%	1165	100.0%	2084	100.0%	19.208	0.014
Body Mass Index	Underweight (<18.5)	0	0.0%	4	0.4%	9	0.8%	13	0.6%		
	Healthy weight (18.5-24.9)	5	18.5%	111	12.4%	179	15.4%	295	14.1%		
	Overweight (25-29.9)	1	3.7%	141	15.8%	165	14.2%	307	14.7%		
	Obese (≥30)	3	11.1%	238	26.6%	200	17.2%	441	21.1%		
	Unknown	18	66.7%	400	44.7%	612	52.5%	1030	49.4%		
	Total	27	100.0%	894	100.0%	1165	100.0%	2086	100.0%	23.487	0.001
Use of oral contraceptive pill	Never	8	29.6%	182	20.4%	619	53.1%	809	38.8%		
	Current	2	7.4%	32	3.6%	17	1.5%	51	2.4%		
	Previous	10	37.0%	581	65.0%	390	33.5%	981	47.0%		
	Unknown	7	25.9%	99	11.1%	139	11.9%	245	11.7%		
	Total	27	100.0%	894	100.0%	1165	100.0%	2086	100.0%	259.253	<0.001
Menopausal status	Pre-menopausal	5	18.5%	179	20.0%	255	21.9%	439	21.0%		
	Peri-menopausal	1	3.7%	85	9.5%	95	8.2%	181	8.7%		
	Post-menopausal	18	66.7%	591	66.1%	762	65.4%	1371	65.7%		
	Unknown	3	11.1%	39	4.4%	53	4.5%	95	4.6%		
	Total	27	100.0%	894	100.0%	1165	100.0%	2086	100.0%	2.735	0.603
Family history of breast cancer	Yes	10	37.0%	416	46.5%	384	33.0%	810	38.8%		
	No	16	59.3%	456	51.0%	754	64.7%	1226	58.8%		
	Unknown	1	3.7%	22	2.5%	27	2.3%	50	2.4%		
	Total	27	100.0%	894	100.0%	1165	100.0%	2086	100.0%	40.198	<0.001

**Unknown cases excluded from analysis*

Table 3. Tumour characteristics for malignancy in women born in Iran, Australia and other countries (N=2088 tumours)

Tumour characteristic		Iran		Australia		Other country		Total		X^2 value*	P
		N	%	N	%	N	%	N	%		
Uni/bilateral breast cancer	Unilateral cancer	27	100.0%	893	99.8%	1164	99.8%	2084	99.8%		
	Bilateral synchronous cancer	0	0.0%	2	0.2%	2	0.2%	4	0.2%		
	Unknown	0	0.0%	0	0.0%	0	0.0%	0	0.0%		
	Total	27	100.0%	895	100.0%	1166	100.0%	2088	100.0%	0.124	0.940
Method of Detection	Screen-detected	10	37.0%	489	54.6%	548	47.0%	1047	50.1%		
	Symptomatic	15	55.6%	379	42.3%	566	48.5%	960	46.0%		
	Unknown	2	7.4%	27	3.0%	52	4.5%	81	3.9%		
	Total	27	100.0%	895	100.0%	1166	100.0%	2088	100.0%	11.481	0.003
Palpability	Palpable	21	77.8%	739	82.6%	987	84.6%	1747	83.7%		
	Not palpable	3	11.1%	115	12.8%	115	9.9%	233	11.2%		
	Unknown	3	11.1%	41	4.6%	64	5.5%	108	5.2%		
	Total	27	100.0%	895	100.0%	1166	100.0%	2088	100.0%	4.268	0.118
Type of malignancy	DCIS	3	11.1%	108	12.1%	182	15.6%	293	14.0%		
	Invasive cancer	24	88.9%	775	86.6%	964	82.7%	1763	84.4%		
	Unknown	0	0.0%	12	1.3%	20	1.7%	32	1.5%		
	Total	27	100.0%	895	100.0%	1166	100.0%	2088	100.0%	5.659	0.059
Grade DCIS (n=293)	Low	0	0.0%	6	5.6%	20	11.0%	26	8.9%		
	Intermediate	1	33.3%	22	20.4%	47	25.8%	70	23.9%		
	High	1	33.3%	70	64.8%	101	55.5%	172	58.7%		
	Unknown	1	33.3%	10	9.3%	14	7.7%	25	8.5%		
	Total	3	100.0%	108	100.0%	182	100.0%	293	100.0%	4.789	0.310
Size DCIS (n=293)	<20mm	1	33.3%	45	41.7%	84	46.2%	130	44.4%		
	20-50mm	2	66.7%	48	44.4%	76	41.8%	126	43.0%		
	>50mm	0	0.0%	1	0.9%	0	0.0%	1	0.3%		
	Unknown	0	0.0%	14	13.0%	22	12.1%	36	12.3%		
	Total	3	100.0%	108	100.0%	182	100.0%	293	100.0%	2.509	0.643
Histology invasive cancer (n=1763)	Ductal NST	19	79.2%	566	73.0%	707	73.3%	1292	73.3%		
	Invasive lobular	3	12.5%	76	9.8%	93	9.6%	172	9.8%		
	Tubular	0	0.0%	16	2.1%	17	1.8%	33	1.9%		
	Medullary	0	0.0%	2	0.3%	0	0.0%	2	0.1%		
	Metaplastic	0	0.0%	2	0.3%	4	0.4%	6	0.3%		
	MixedType	0	0.0%	33	4.3%	38	3.9%	71	4.0%		
	Papillary	2	8.3%	17	2.2%	23	2.4%	42	2.4%		
	Mucinous	0	0.0%	23	3.0%	31	3.2%	54	3.1%		
	Other	0	0.0%	30	3.9%	38	3.9%	68	3.9%		
	Unknown	0	0.0%	10	1.3%	13	1.3%	23	1.3%		
	Total	24	100.0%	775	100.0%	964	100.0%	1763	100.0%	10.376	0.846
Grade Invasive cancer (n=1763)	Grade 1	5	20.8%	183	23.6%	167	17.3%	355	20.1%		
	Grade 2	5	20.8%	295	38.1%	401	41.6%	701	39.8%		
	Grade 3	13	54.2%	280	36.1%	370	38.4%	663	37.6%		
	Unknown	1	4.2%	17	2.2%	26	2.7%	44	2.5%		
	Total	24	100.0%	775	100.0%	964	100.0%	1763	100.0%	14.383	0.006
Size Invasive cancer (n=1763)	pT1	11	45.8%	385	49.7%	448	46.5%	844	47.9%		
	pT2	11	45.8%	337	43.5%	425	44.1%	773	43.8%		
	pT3	0	0.0%	1	0.1%	11	1.1%	12	0.7%		
	Unknown	2	8.3%	52	6.7%	80	8.3%	134	7.6%		
	Total	24	100.0%	775	100.0%	964	100.0%	1763	100.0%	7.501	0.112
ER Status (n=1763) invasive cancer	Positive	21	87.5%	625	80.6%	795	82.5%	1441	81.7%		
	Negative	2	8.3%	123	15.9%	141	14.6%	266	15.1%		
	Unknown	1	4.2%	27	3.5%	28	2.9%	56	3.2%		
	Total	24	100.0%	775	100.0%	964	100.0%	1763	100.0%	1.442	0.486
PR Status (n=1763) invasive cancer	Positive	19	79.2%	593	76.5%	746	77.4%	1358	77.0%		
	Negative	4	16.7%	153	19.7%	188	19.5%	345	19.6%		
	Unknown	1	4.2%	29	3.7%	30	3.1%	60	3.4%		
	Total	24	100.0%	775	100.0%	964	100.0%	1763	100.0%	0.156	0.925
HER2 Status (n=1763) invasive cancer	Positive	2	8.3%	74	9.5%	119	12.3%	195	11.1%		
	Negative	21	87.5%	608	78.5%	745	77.3%	1374	77.9%		
	Unknown	1	4.2%	93	12.0%	100	10.4%	194	11.0%		
	Total	24	100.0%	775	100.0%	964	100.0%	1763	100.0%	3.290	0.193
Multifocal (n=1763) invasive cancer	Yes	4	16.7%	179	23.1%	218	22.6%	401	22.7%		
	No	19	79.2%	550	71.0%	686	71.2%	1255	71.2%		
	Unknown	1	4.2%	46	5.9%	60	6.2%	107	6.1%		
	Total	24	100.0%	775	100.0%	964	100.0%	1763	100.0%	0.634	0.728
Multifocality, all tumours (n=2088)	Yes	4	14.8%	199	22.2%	250	21.4%	453	21.7%		
	No	22	81.5%	644	72.0%	840	72.0%	1506	72.1%		
	Unknown	1	3.7%	52	5.8%	76	6.5%	129	6.2%		
	Total	27	100.0%	895	100.0%	1166	100.0%	2088	100.0%	1.008	0.604

**Unknown cases excluded from analysis*

Table 4. Surgical treatment factors for malignancy in women born in Iran, Australia and other countries (n=2086 women)

Tumour characteristic		Iran		Australia		Other country		Total		X^2 value*	P
		N	%	N	%	N	%	N	%		
Initial operation (n=2086)	Breast conservation	16	59.30%	627	70.10%	787	67.60%	1430	68.60%		
	Mastectomy	11	40.70%	266	29.80%	373	32.00%	650	31.20%		
	Unknown	0	0.00%	1	0.10%	5	0.40%	6	0.30%		
	Total	27	100.00%	894	100.00%	1165	100.00%	2086	100.00%	2.464	0.292
Initial breast conservation type (n=1430)	Standard wide local excision	14	87.50%	559	89.20%	718	91.20%	1291	90.30%		
	Therapeutic mammaplasty	2	12.50%	65	10.40%	65	8.30%	132	9.20%		
	Wide excision and local flap	0	0.00%	3	0.50%	4	0.50%	7	0.50%		
	Unknown	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
	Total	16	100.00%	627	100.00%	787	100.00%	1430	100.00%	2.133	0.711
Re-excision after breast conservation (n=1430)	Yes	1	6.30%	113	18.00%	144	18.30%	258	18.00%		
	No	15	93.80%	506	80.70%	634	80.60%	1155	80.80%		
	Unknown	0	0.00%	8	1.30%	9	1.10%	17	1.20%		
	Total	16	100.00%	627	100.00%	787	100.00%	1430	100.00%	1.579	0.454
Final Operation (n=2086)	Breast conservation	15	55.60%	579	64.80%	728	62.50%	1322	63.40%		
	Mastectomy	12	44.40%	314	35.10%	432	37.10%	758	36.30%		
	Unknown	0	0.00%	1	0.10%	5	0.40%	6	0.30%		
	Total	27	100.00%	894	100.00%	1165	100.00%	2086	100.00%	1.698	0.428
Reconstruction after mastectomy (n=758)	No immediate reconstruction	6	50.00%	165	52.50%	296	68.50%	467	61.60%		
	Immediate reconstruction	6	50.00%	149	47.50%	136	31.50%	291	38.40%		
	Unknown	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
	Total	12	100.00%	314	100.00%	432	100.00%	758	100.00%	20.304	<0.001
Contralateral prophylactic mastectomy (n=758) (unilateral cancer undergoing ipsilateral mastectomy)	No CPM	8	66.70%	245	78.00%	393	91.00%	646	85.20%		
	CPM	4	33.30%	69	22.00%	39	9.00%	112	14.80%		
	Unknown	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
	Total	12	100.00%	314	100.00%	432	100.00%	758	100.00%	27.5384	<0.001
Reconstruction after CPM (n=112)	No immediate reconstruction	1	25.00%	19	27.50%	18	46.20%	38	33.90%		
	Immediate reconstruction	3	75.00%	50	72.50%	21	53.80%	74	66.10%		
	Unknown	0	0.00%	0	0.00%	0	0.00%	0	0.00%		
	Total	4	100.00%	69	100.00%	39	100.00%	112	100.00%	4.000	0.135

**Unknown cases excluded from analysis*

residence, had significantly less disadvantage than the other two groups (X^2=19.208, p=0.014). This indicates that Iranian-born women were living in higher socio-economic suburbs than the other groups.

Iranian women were less likely to be overweight or obese (X^2=23.487, p=0.001) and less likely to have ever used the oral contraceptive pills ($X^2$259.253, p<0.001) than the other two groups.

Tumour characteristics

Tumour characteristics are shown in Table 3. Iranian-born women were less likely to present with a screen-detected breast cancer (37%) compared to Australian-born (54.6%) or other women (50.1%, X^2= 11.481, p=0.003). However, palpability of the tumour was no different between groups (X^2= 4.268, p=0.118).

There was no difference in the type of tumour between country of birth groups (DCIS versus invasive cancer, X^2=4.268, p=0.118) or in grade or size of DCIS (X^2=4.789, p=0.310 and X^2=2.509, p=0.643). For invasive cancer, there was no difference in histological type or size of tumour (X^2=10.376, p=0.846 and X^2=7.501, p=0.112). However, Iranian-born women had higher grade invasive cancers. Grade 3 cancers were present in 54.2% of Iranian-born women, compared to 36.1% of Australian-born women and 38.4% of others (X^2=14.383, p=0.006). There was no difference in ER, PR or HER2 receptor status or in multifocality of tumours.

Surgical treatment

Factors related to surgical treatment are shown in Table 4. There was no difference in final operation between groups (breast conservation vs mastectomy (X^2=1.698, p=0.428) or re-excision rate after initial breast conservation (X^2=1.579, p=0.454). The rate of immediate reconstruction after mastectomy was significantly lower in the 'other' group compared to Iranian or Australian-born women (X^2=20.304, p<0.001). This group was also less likely to undergo contralateral prophylactic mastectomy (X^2=27.5384, p<0.001.)

Discussion

This study compares breast cancer variables in Iranian-born women treated in Australia (n=27) with Australian-born women (n=894) and those born in other countries (n=1165). The present study showed that Iranian-born women were younger than the other

groups, with a mean age of 53.9 (around five years younger than the overall cohort) and 85% of Iranian-born women under the age of 66. Iranian-born women were less likely to be overweight or obese, and less likely to live in a disadvantaged area. They were less likely to present with a screen-detected cancer and more likely to have a high-grade cancer.

The Iranian-born population in Australia (median age 35 years) is younger than other migrants (median age 44 years) and the Australian population overall (median age 38 years).[9] This may partly explain the younger age of the Iranian-born women in the present study.

Australia has a free national screening program that targets women aged 50–74 and allows women aged 40–49 to attend on request. The overall participation rate in the screening program for women who speak a language other than English at home is <49%, compared to around 55% in English-speaking women.[5] This is thought to be related to cultural and language issues which prevent the screening message from reaching women in minority groups or make breast screening challenging for cultural reasons. No specific information is available about rates of screening attendance specifically in women born in Iran. Lower screening attendance may explain why symptomatic rather than screen-detected cancers are more common in Iranian-born women. Lower attendance may be due to language and cultural barriers, however it could also be due to the younger cohort. The present study found that 37% of cancers in Iranian-born women occurred before the age of 50, so these women were younger than the age when they are formally invited to commence screening. Another hypothesis is that screening attendance in Iranian-born women is good (and some may be attending for screening between ages 40 and 50 on request) but there could be more interval cancers because high-grade cancers are more common. Further research is needed to examine this.

Programs to ensure that the screening message is reaching its target age group in cultural minority groups as well as the overall Australian population is essential. Some such programs are in place such as the Pink Sari program that targets women in Indian and Sri Lankan communities.[11] It may also be appropriate to invite Iranian-born women to start screening at a younger age than Australian-born women. The trade-offs of this in terms of recall rate and cost would need to be examined.

The proportion of high-grade tumours in Iranian women has implications for treatment and support. Information about treatment with chemotherapy was not available in this study. It is hypothesised that Iranian-born women were more likely to be recommended for chemotherapy than the other groups as they were younger as well as having higher grade tumours. This means that culturally appropriate education and support is particularly important for these women as they may be more likely to have more toxic treatment with more significant side effects than non-Iranian-born women.

Previous research in Australia has shown that unmet needs are higher in cancer survivorship for women from culturally and linguistically diverse backgrounds compared to Australian-born women.[12,13] Iranian-born women may therefore be at higher risk of unmet long-term needs, especially if they have received more toxic treatments such as chemotherapy. Iranian-born women, with higher-grade cancers, are also more likely to be recommended for extended adjuvant endocrine therapy with its consequent side effects, which are frequently more significant in younger cancer survivors.[14] Therefore, support is required in the long-term, not just at the time of initial cancer treatment. Patient-reported outcome measures were not part of this study; however, this is a recommended area for future research gain further insight into the cancer experience of Iranian-born women.

Iranian-born women in this study were less likely to live in a geographic area of economic disadvantage than women in the comparator groups. They may, therefore, have a higher level of education and be receptive to educational and support material about breast cancer.

This study has several limitations. The number of Iranian-born women was very small in comparison to women in the other groups. The retrospective study design brings bias, and there was missing information for some variables. The non-Australian-born comparison group was extremely heterogeneous (women born in 79 different countries), which may limit conclusions about that group. Many women in the Iranian-born and the 'other' group had limited English and were interviewed with health care interpreters so the accuracy the background information provided may have been sub-optimal. Patient-reported outcomes were not included in this study. This information would provide additional insight into the cancer experience of Iranian-born women.

In conclusion, this study showed that Iranian-born women treated for breast cancer in Australia were younger, had higher-grade tumours and were less likely to have a screen-detected cancer than Australian-born women or women born in other countries. Strategies to encourage screening participation in Iranian-born women are required. Support for these women during cancer treatment and in survivorship is required as they are more likely to have received toxic treatments such as chemotherapy and extended adjuvant endocrine therapy due to their younger age and higher-grade tumours. Further research into patient-reported outcomes is required to understand the lived experience of cancer in these women.

Conflicts of interest

The authors have no conflicts of interest to declare.

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