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Clinical Presentation and Factors Associated with Stage at Diagnosis in Young Women With Breast Cancer: A Pan-Canadian Prospective Cohort Study (RUBY)

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1,420 women with breast cancer

≤40 years
mean 35.2; median 36
range 18–40

33 diverse sites
rural, urban, community, academic
July 2015–June 2022

1,201 patient reported questionnaires (84.6%)

1,343 invasive cancers (94.6%)

81.4% stage I–II at diagnosis

Background and objective

- Factors associated with stage in young women remain incompletely understood
- Describe stage at diagnosis and associated demographic and clinical factors in young women in RUBY

Methods

01 Enrolled before any treatment

- Prospective cohort, Stage 0–IV, age ≤40
- Enrolment at initial surgical consultation
- Written consent and site ethics approval

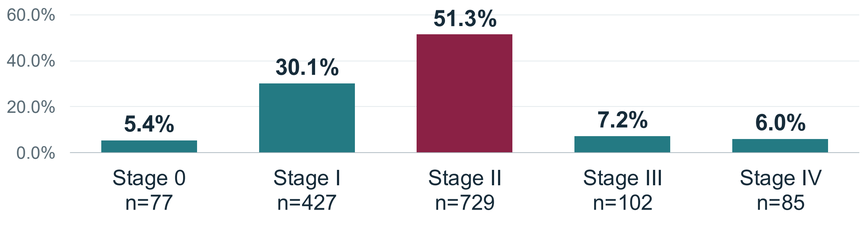
02 Collect baseline + chart data

- REDCap questionnaires: sociodemographics, reproductive and medical history, family history, prior imaging and self-rated breast cancer knowledge
- Chart abstraction at 12 months: tumour characteristics and stage at presentation

03 Compare stage distributions

- Descriptive analysis and comparisons across demographic and clinical characteristics
- Table-specific denominators and missing responses

Clinical stage at diagnosis

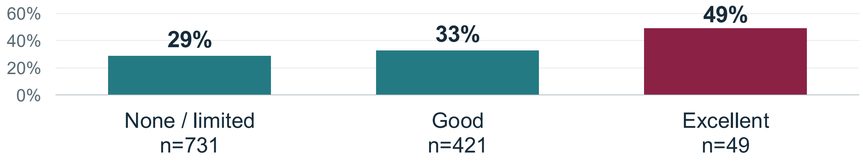


Stage II was most common; most presented early at Stage I–II

Self-rated breast cancer knowledge

Stage I by knowledge level

Overall stage comparison: p=0.008



Clinical factors and stage

Breastfeeding

22% (5/23 women)

Stage IV among women currently breastfeeding

Past / never breastfed: 5.0% each

Overall stage comparison: p=0.033

Pregnancy

11% (3/27 women)

Stage IV among women pregnant at diagnosis

Overall stage comparison: p=0.338

BMI category

9.5% (18/190 women)

Stage IV in the obese category

Normal weight: 4.5%; overweight: 4.8%

Overall stage comparison: p=0.008

Other stage comparisons

Factor	p value	Factor	p value
Province	0.237	Income	0.883
Pre post COVID diagnosis†	0.835	Marital status	0.828
Race/ethnicity	0.669	Employment status	0.116
Education	0.615	Age groups	0.439
Age (continuous)	**0.018**	Neuroticism	0.214
First-degree family history	0.267		

†2015–2019 vs 2020–2022

Interpretation and limitations

- Vast majority of ≤ 40 with breast cancer present early stage 0, I or II, with stage II the most prevalent
- Common associations such as low socioeconomic status, education and race with advanced stage were not seen
- Small numbers of breast feeding and pregnancy limit analysis due to potential confounding and multiple comparisons

Clinical implication

- Support and public awareness for symptom recognition and timely assessment of breast symptoms, particularly during pregnancy and breastfeeding
- Further analyses are needed to clarify these associations

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