



Patient Needs in Focus: AI-Powered Insights for Breast Care Nurses Using NLP

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Background & Purpose

Why Patient-Centered Care Needs a New Lense

Although medical advances have significantly improved breast cancer survival rates, **psychosocial care remains insufficient**, especially for **younger women**. A renewed focus on truly patient-centered care is needed – one that **recognizes** and **integrates individual needs** into **clinical practice**.¹⁻⁸

- Breast Cancer is the most common cancer among women in EU-27 (335,457 new cases in 2020)⁹
- Psychosocial care remains inadequate despite physical treatment progress¹⁰
- Younger women face more aggressive cancer types leading to physical, emotional & social effects^{11, 12}
- Gaps exist between patient and provider perspectives on psychosocial needs¹²
- Younger patients often lack personalized medical information¹³
- Recognizing individual needs is crucial for effective care
- Tailored support, especially from Breast Care Nurses, can improve quality of life and coping ability¹⁴

Methodology:

Analyzing Patient-Generated Content using Natural Language Processing

This study used advanced **NLP** and **AI-based techniques** to systematically analyze **patient-generated content**. Combining **semantic analysis**, **topic modeling** and **sentiment analysis** enabled deep understanding of patients' needs during adjuvant therapy.

- Data sourced from breastcancer.org, a breast cancer forum with 5 million posts
- Natural Language Processing used for analysis, focusing on semantic relationships via word embeddings (word2Vec, GloVe, fastText)^{16,17}
- Topic modeling applied using Non-negative Matrix Factorization (NMF) on TF-IDF-based Document-Term Matrix to identify thematic structures
- Data preprocessing included lowercase conversion, stop word removal & lemmatization
- 10 topics visualized with word clouds, scaled by significance for clear thematic interpretation¹⁹
- Sentiment analysis classified forum posts into positive, negative or neutral, enhanced by a 5-level scale

What Patients Talk About: Four Categories of Need

Connection & Peer Support

- [illegible]

Burden of Hormonal Therapy & Need for Information

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Key Findings

What Patients Talk About: Four Categories of Need

3. Psychosocial needs

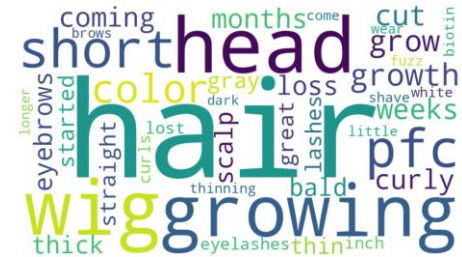
Hair loss and side effects **affect self-image & emotional health.**

"Hair loss was the worst part."

"I feel unattractive because of weight gain."

"No one wants to help."

Support for body image & psychological well-being is crucial.



4. Emotional support

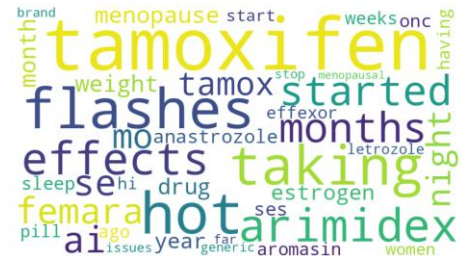
Nurses play a key role – but care can feel **impersonal**. Patients describe **loss of control** & **need for empathy**.

"The real heroes are nurses."

"I've lost so much freedom."

"They have no idea what are we're going through."

Continuous, compassionate care is essential.



Implications for Breast Care Nursing

Improving breast care nursing requires **flexible, patient-centered strategies** – from **assessment tools to digital monitoring**. Continuous **training, interdisciplinary collaboration** and **adaption to local systems** ensure care remains responsive and effective.

- Patients show **diverse needs**: support, information, psychosocial and emotional support
- Use of assessment tools like the **Toronto Information Needs Questionnaire** and **Olando Care Process Report** can improve care.
- **Patient navigation** provides essential knowledge for supporting women through treatment.
- Ongoing **training** for Breast Care Nurses is key to maintaining care quality
- **eHealth tools like IConnecta't** can monitor psychosocial needs in real time
- **Interdisciplinary collaboration** (e.g. with psychologists) is crucial but may cause a role ambiguity
- Methods must align with BCN preferences, patient willingness and institutional conditions – there is no one-size-fits-all solution



THANK YOU



Stefanie Scholz



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