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Identifying return-to-work trajectories among breast cancer survivors using sequence analysis

Elise Rubion1, Bertrand Porro3, Fabien Gilbert1, Marianne Bourdon1, Yves Roquelaure1
Melanie Bertin1,2, melanie.bertin@ehesp.fr
1Université d'Angers, Angers, France; 2Institut de cancérologie (ICO), Angers, France; 3EHESP, Rennes, France

Introduction & Objectives

Context
- The return-to-work (RTW) process after breast cancer (BC) can be complex.
- Simple static measures used to assess RTW may ignore this dynamic multi-stage process that is yet important for targeting interventions aimed at reducing poor RTW outcomes.

Objectives
- (1) Identify RTW trajectories after BC using the sequence analysis method
- (2) Describe their underpinning personal, medical, psychological and occupational factors

Study population
- The ELCCA II prospective cohort included 128 BC patients in 2015-2016.
- BC patients were followed at 1 month, 6 months and annually after 1 year following their BC diagnosis
- Medical and sociodemographic characteristics, and quality of life (QoL) were assessed at inclusion and at the follow-ups.
- A retrospective occupational calendar with a 6-month time scale from diagnosis up to 3 years later was completed by BC patients at their 4-year follow-up (Figure 1).
- BC Patients notified one of the 7 following five occupational situations: “full-time”, “part-time”, “sick leave”, “unemployment”, “training courses”, “(pre)retirement”, “other inactivities”

Results
- 52 BC patients were active at the time of their diagnostic that completed their occupational calendar were included.
- 3 RTW trajectories’ patterns were identified among BC patients by sequence analysis (Figure 3-A).
- Socio-demographic, medical and QoL (QLQ-C30) varied according to RTW trajectories (Figure 3-B).

Discussion & Conclusion
- The application of sequence analysis highlighted the heterogeneity of the RTW process among BCS.
- It captures trajectories of multiple states and transitions provided a holistic, longitudinal and diachronic approach of RTW.
- Three different patterns of RTW trajectories after breast cancer were identified and underlined a number of key insights not found using conventional static methods.
- However, these results have to be confirmed by using a larger sample of BCS.

Sequence analysis
- Sequence analysis is a quantitative biographical approach
- It generates a sequence for every BC patients based on their individual occupational situations every 6 months from their diagnosis up to 3 years after their diagnosis (Figure 2).
- Similarity between BC patients’ occupational trajectories were estimated using the optimal matching (OM) distance algorithm.
- An agglomerative hierarchical clustering with the Ward’s linkage method was used to identify patterns of occupational trajectories after BC patients diagnostic (i.e. clusters) based on the distance matrix previously elaborated.
- 5 occupational situations were kept in state sequence analysis (Figure 2).

Table 1: Inclusion and exclusion criteria

<table>
<thead>
<tr>
<th>Type of Patient</th>
<th>Percentage</th>
<th>BC patients at time of their diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full-time</td>
<td>66.7%</td>
<td>44.9%</td>
</tr>
<tr>
<td>Part-time</td>
<td>33.3%</td>
<td>49.7%</td>
</tr>
<tr>
<td>Sick leave</td>
<td>85.7%</td>
<td>67.9%</td>
</tr>
<tr>
<td>Unemployment</td>
<td>66.7%</td>
<td>74.4%</td>
</tr>
<tr>
<td>Training courses</td>
<td>14.3%</td>
<td>100%</td>
</tr>
<tr>
<td>(Pre)retirement</td>
<td>85.7%</td>
<td>100%</td>
</tr>
<tr>
<td>Other inactivities</td>
<td>49.7%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Figure 2: Example of the BC patients sequences representing their occupational situation from their diagnosis up to 3 years later

Figure 3: Patterns of RTW trajectories among BC patients in the ELCCA II cohort (n=52).

Figure 4: Scores QLQ-C30 at diagnostic

Table 2: Characteristics and social outcomes of patients & BCTS

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