Dear Editor,

Non-adherence to medications is a significant health issue, as it can reduce the efficacy of therapeutic management and increase the likelihood of relapse. 1 Ensuring that patients with breast cancer (BC) adhere to the prescribed duration of endocrine therapy (ET) is, however, difficult, because of the long duration of treatment. Several studies have evaluated adherence to ET. 2-4 To our knowledge, no studies have been conducted in the Middle East to evaluate adherence to ET. We conducted a study to evaluate the level of adherence to ET among patients with BC. The study also aimed to describe the patients’ perceptions of ET and associations between adherence and patient-related factors.

This study was conducted between October 2017 and July 2018 at King Hussein Cancer Center. Ethics approval was granted by the institutional review board on the 5th October 2017. The study involved administering a questionnaire to patients being treated for BC. Patients were recruited at the hospital’s outpatient pharmacy and the chemotherapy infusion clinic. Those who had a refill for ET (tamoxifen, anastrazole, examastaine, or
letrazole) and had been on therapy for at least 1 month were included in the study. The questionnaire contained a statement in the first page which was considered as a consent form. Patients were consented as they agreed to participate in the study.

The questionnaire was developed by a survey specialist at our institution since, to our knowledge, there was no validated, well-established questionnaire in Arabic. The questionnaire contained items that were reported by Pourcelot et al. The questionnaire included questions on adherence (the number of missed doses of ET during the previous month) and type and duration of ET, perception about ET. The survey specialist and the clinical investigators assessed the items in term for clarity and relevance for the patients to establish the face and content validity of the questionnaire. The questionnaire was pilot tested in a small group of patients for one week and modified based on the feedback received.

Continuous data were presented as means and SD, while categorical data were presented as numbers and percentages. \( P \leq 0.05 \) was considered statistically significant. Anova test was used to determine any associations between adherence and continuous data while chi-square test was used for categorical data.

During the study period, 202 questionnaires were completed. The mean age of patients was 45.8 years ± 10.7(SD). Baseline demographics are summarized in Table 1. Among the enrolled patients, 113 (57.4%) were on tamoxifen, 34 (17.3%) on letrazole, 36 (18.3%) on anastrozole, and 10 (5.1%) on exemastane. Four patients (2%) did not know the name of the ET they were taking, and five patients did not answer the question. ET had been taken for \( \leq 6 \) months by 59 of the 202 patients (29.2%), for 6–12 months by 51 patients (25.2%), for 1–3 years by 77 patients (38.1%), and for 3–5 years by 15 patients (7.4%).

We assessed the patients’ perceptions about ET. About two-third of the patients (63%) reported that they didn’t know to what extent they needed ET and about half of the patients (47%) didn’t know whether ET could help in reducing recurrence of BC. However, the majority of the patients were aware of their treatment plan (90%) and reported understanding of their disease (91%). Most of the patients (86%) reported that
86 they had received information on the importance of ET from their physicians but only
87 half of the patients (52 %) reported having received medication counseling from a
88 pharmacist.
89
90 The only factor that was significantly associated with adherence was the duration of
91 treatment (P = 0.048); the shorter the duration of ET, the fewer reported missed doses.
92
93 We found a relatively high rate of adherence to ET. Patients were considered adherent if
94 they took at least 80% of their prescribed medication over a certain period. 5 In our study,
95 the majority of patients (99.5%) reported adherence rates of 80% or more over 1 month.
96 Studies have reported high as well as low rates of adherence. 2,3,5
97
98 In our study, most participants reported that they had received information on the
99 importance of ET, but interestingly, this information was mostly from their physicians
100 rather than pharmacists. We found no association between the high adherence and the
101 information provided by physicians which might be due to the nature of the study as there
102 was no objective measure of the physician’s role in patient’s counseling. The only factor
103 associated with adherence was the duration of treatment. A similar association was
104 reported by Robinson et al. who found that the rate of adherence decreased from year 1 of
105 treatment throughout year 5 by 50%. 4 We were unable to draw any conclusion about
106 adherence over the course of ET because of the short duration of follow-up in this study.
107
108 Several studies have evaluated the association between adherence and patient-related
109 factors. 2,5 In cross-sectional survey, the risk factors associated with non-adherence were
110 comorbid conditions, poly-pharmacy, younger age. 2 In our study, age and whether the
111 patient was taking other medications were not significantly associated with adherence.
112 The present study has limitations. First is the use of a self-administered questionnaire as
113 there was no objective measure of adherence for more accurate assessment, which might
114 have resulted in overestimation of adherence. In addition, the small number of patients
115 that have taken the ET for more than 3 years, response rate which defined as the
116 percentage of patients who answered the questionnaire from the total number of patients
117 was not calculated, and the included patients were on ET for more than one month which
might affect the adherence as the behaviors of patients would change over the period of treatment.

We found a relatively high level of adherence to ET among patients with BC. However, there was a gap in the counseling provided by pharmacists. Further studies should be conducted to assess adherence of longer duration and to further investigate the factors that may be associated with non-adherence, such as socioeconomic status.

Authors’ Contribution

NF and KA Conceptualized and designed the manuscript. AG, MD, RA, HS, HS and RR Collected and assembled the data. KA analyzed the data. NF, AG and KA wrote the manuscript. All authors approved the final version of the manuscript.

References


**Table 1**: Baseline demographics of 202 patients with breast cancer.

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Item</th>
<th>Number of patients (%) who answered the question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
<td>Married</td>
<td>163/200 (81.5%)</td>
</tr>
<tr>
<td></td>
<td>Single</td>
<td>19/200 (9.5%)</td>
</tr>
<tr>
<td></td>
<td>Widowed</td>
<td>13/200 (6.5%)</td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>5/200 (2.5%)</td>
</tr>
<tr>
<td>Educational level</td>
<td>Bachelor's degree</td>
<td>59/199 (29.6%)</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>58/199 (29.1%)</td>
</tr>
<tr>
<td></td>
<td>Diploma</td>
<td>51/199 (25.6%)</td>
</tr>
<tr>
<td></td>
<td>Master’s or doctoral degree</td>
<td>13/199 (6.5%)</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>18/199 (9%)</td>
</tr>
<tr>
<td>Area of residence</td>
<td>Amman</td>
<td>127/190 (66.8%)</td>
</tr>
<tr>
<td></td>
<td>Outside Amman</td>
<td>55/190 (28.9%)</td>
</tr>
<tr>
<td></td>
<td>Outside Jordan</td>
<td>8/190 (4.2%)</td>
</tr>
<tr>
<td>Family income per month (JD*)</td>
<td>&lt; 500</td>
<td>98/190 (51.6%)</td>
</tr>
<tr>
<td></td>
<td>500–1000</td>
<td>72/190 (37.9%)</td>
</tr>
<tr>
<td></td>
<td>1000–2000</td>
<td>16/190 (8.4%)</td>
</tr>
<tr>
<td></td>
<td>&gt; 2000</td>
<td>4/190 (2.1%)</td>
</tr>
<tr>
<td>Nationality</td>
<td>Jordanian</td>
<td>179/199 (89.9%)</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>20/199 (10.1%)</td>
</tr>
<tr>
<td>Family history of breast cancer</td>
<td>Yes</td>
<td>55/199 (27.6%)</td>
</tr>
<tr>
<td>On other medications</td>
<td>Yes</td>
<td>55/187 (29 %)</td>
</tr>
</tbody>
</table>

*JD*: Jordanian dinar, the currency of Jordan.