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# Baseline Quality of Life and Its Predictors among Jordanian Women with Breast Cancer: Findings from an Ongoing Randomized Controlled Trial

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## ABSTRACT

**Objective:** Breast cancer is the most common cancer among women in Jordan. Survivors often experience impaired quality of life (QoL) due to various sociodemographic and clinical factors. Understanding QoL at the time of diagnosis is essential for developing effective interventions. This study aimed to assess baseline QoL and to identify predictors of QoL among Jordanian women with breast cancer prior to any intervention.

**Materials and Methods:** This cross-sectional analysis examined baseline data from an ongoing randomized controlled trial registered with Australian New Zealand clinical trials registry. Two hundred women with breast cancer completed the Arabic versions of the European Organisation for Research and Treatment of Cancer (EORTC) QLQ-C30 and EORTC QLQ-BR23 questionnaires at study entry, prior to randomization and intervention. Sociodemographic and clinical variables were collected and analyzed using SPSS version 24. Multiple regression analysis was performed to identify predictors of QoL.

**Results:** The mean age of participants was 48.0±8.3 years. The global QoL score was 57.4/100. Higher scores were observed for role and social functioning, whereas emotional functioning had the lowest scores. The most frequently reported symptoms were insomnia, fatigue, and pain multivariate linear regression identified younger age (positively associated) and total breast symptoms (negatively associated) as significant independent predictors of QLQ-C30 global QoL. For QLQ-BR23, the overall model was significant, although no individual predictor reached statistical significance.

**Conclusion:** Jordanian women with breast cancer experience moderate impairment in QoL at study entry, primarily influenced by symptom burden and age. These baseline findings provide a foundation for interpreting intervention effects in the ongoing randomized controlled trial. Routine assessment of symptoms and culturally sensitive supportive care are recommended to improve patient outcomes.

**Keywords:** Quality of life; breast cancer; Jordan; predictors; EORTC QLQ-C30; EORTC QLQ-BR23; baseline data; randomized controlled trial

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**KEY POINTS**

- Significant Quality of Life Impairment Identified: Jordanian women with breast cancer face moderate but notable impairment in their quality of life, underscoring a critical patient care gap.
- Key Predictors Revealed: Clinical factors (e.g., cancer stage, treatment type) and the burden of symptoms are significant predictors of this compromised quality of life.
- Pronounced Emotional Distress: Emotional functioning is particularly affected, alongside a high symptom burden, highlighting specific areas for targeted intervention.
- Urgent Call for Integrated Care: There is a crucial need for culturally sensitive and integrated supportive care strategies to effectively improve these patients' well-being.

## Introduction

Breast cancer continues to be the most frequently diagnosed malignancy among women worldwide and represents a major public health concern in Jordan, where it constitutes nearly 40% of all cancers diagnosed among females (1, 2).

Although advances in screening programs and therapeutic interventions have substantially improved survival outcomes, the disease and its treatments—including chemotherapy, axillary lymph node dissection, and endocrine therapy—often lead to considerable physical, psychological, and social challenges for patients (3-6).

Consequently, health-related quality of life (HRQoL) has become an essential patient-centered outcome in breast cancer survivorship research. HRQoL reflects multiple dimensions of well-being, including physical functioning, symptom burden, emotional status, social relationships, and spiritual aspects of life (4, 5, 7).

In Middle Eastern countries, including Arab societies, women with breast cancer frequently experience poorer HRQoL compared with global averages. This may be attributed to delayed diagnosis, limited access to comprehensive supportive care services, and sociocultural factors that influence psychological coping and illness perception (4, 8).

Previous systematic reviews have identified several determinants that may affect HRQoL among breast cancer survivors. These include sociodemographic characteristics, clinical status, treatment-related variables, and psychosocial conditions (3, 4, 7, 9-12).

Evidence from Jordan suggests that women with breast cancer may experience elevated levels of psychological distress, increased symptom burden, and varying degrees of social isolation. Cultural factors, such as the importance of family gatherings and concerns related to eating difficulties during chemotherapy-induced dysphagia, may further complicate patients' experiences (3, 7). In addition, interventions such as complete decongestive therapy following axillary lymph node dissection have demonstrated potential benefits in reducing breast cancer-related lymphedema and improving QoL (6).

This section discusses the specific predictors of QoL among Jordanian women with breast cancer. Existing cross-sectional studies suggest associations between QoL and factors such as demographic characteristics, symptom distress, spirituality, and religious beliefs; however, comprehensive data are still scarce (10, 11). Moreover, regional reviews indicate that research addressing QoL among Arab women remains insufficient, particularly in countries such as Jordan, Bahrain, Tunisia, and the United Arab Emirates (4, 8). Psychological distress following diagnosis is also widely reported and may significantly compromise patients' well-being, highlighting the importance of supportive interventions including mindfulness-based approaches and social support programs (7).

Therefore, the present study aims, using the European Organisation for Research and Treatment of Cancer (EORTC) QLQ-C30 and QLQ-BR23 instruments, to assess the QoL of Jordanian women diagnosed with breast cancer and to explore its association with sociodemographic, clinical, treatment-related, and psychosocial variables.

The findings may contribute to the development of culturally appropriate interventions and inform health policies aimed at improving QoL among this population.

## Materials and Methods

### Study Design and Setting

This study presents a cross-sectional analysis of baseline data collected as part of an ongoing randomized controlled trial (RCT) (ANZCTR 12619000095167), which was prospectively registered. The parent RCT evaluates the effectiveness of a psychoeducational intervention program to improve QoL among Jordanian women diagnosed with breast cancer. This baseline analysis was conducted at Al-Bashir Hospital, a tertiary referral center in Amman, Jordan, between January and June 2019, prior to the delivery of any intervention. This study focuses on characterizing QoL and its predictors at study entry, to inform the subsequent interpretation of intervention effects.

### Participants

Two hundred Jordanian women diagnosed with breast cancer and who were receiving treatment were recruited from oncology

inpatient clinics for the parent RCT. Eligible participants (confirmed diagnosis, ongoing treatment, and ability to complete questionnaires; no psychiatric illness or comorbid chronic systemic diseases) were randomly assigned by the primary investigator to the intervention or control groups using a randomized block design. However, this study reports only baseline data collected prior to randomization and intervention

Sample size was calculated using STATA software (power = 0.80, $\alpha = 0.05$, moderate effect size, 9 predictors; minimum n = 119). To account for 10% attrition, 220 participants were approached. Of these, 10 were excluded due to comorbidities, and 10 questionnaires were excluded due to missing data, yielding 200 complete responses. No demographic differences existed between included and excluded participants.

### Baseline Data Analysis Stating

This study focuses exclusively on baseline data collected before randomization and intervention. No intervention effects are reported in this analysis.

### Instruments

Eligible participants completed a comprehensive 55-item questionnaire assessing socio-demographic characteristics (age, educational level, employment status, marital status, monthly income, duration of marriage, occupation, number of children, menopausal status); medical history (chronic diseases, family history); and treatment details (methods, surgery type, post-operative details, histopathology type, stage, and grade). Breast cancer stage was determined according to the American Joint Committee on Cancer 8$^{th}$ edition staging system, based on the TNM classification (tumor size, lymph node involvement, and metastasis).

The study utilized validated Arabic versions of the EORTC QLQ-C30 and QLQ-BR23 questionnaires.

EORTC QLQ-C30 (30 items): This core questionnaire assesses global health status/QoL, five functional scales (physical, role, emotional, cognitive, social), three symptom scales (fatigue, nausea/vomiting, pain), and six single items (dyspnea, insomnia, appetite loss, constipation, diarrhea, financial difficulties). The Arabic version of the QLQ-C30 has been widely validated across various Arabic-speaking populations, demonstrating its reliability and validity in these contexts (13-15).

EORTC QLQ-BR23 (23 items): This breast cancer-specific module includes scales for functional aspects (body image, sexual functioning, future perspective) and for symptoms (arm symptoms, breast symptoms, systemic therapy side effects, upset by hair loss). The Arabic version of the QLQ-BR23 has also been psychometrically validated, confirming its suitability for assessing QoL in Arabic-speaking breast cancer patients (13, 14, 16).

Cronbach's alpha indicated that each subscale had high reliability: EORTC QLQ-C30 = 0.87 and EORTC QLQ-BR23 = 0.86.

Each item was scored on a 4-point Likert scale (1 = "not at all" to 4 = "very much"), except for global health status/QoL items (1 = "very poor" to 7 = "excellent"). Raw scores were transformed to a 0–100 scale, where higher scores indicate better functioning, more severe symptoms, or higher QoL, depending on the scale. The questionnaires were administered by trained female nurses in face-to-face interviews to minimize bias.

### Ethical Approval and Informed Consent

Ethical approval was obtained from the Jordan Ministry of Health's local ethical research committee (ethics committee no: 9694, date: 05.07.2018) and Universiti Sains Malaysia (protocol code: USM/JEPeM/18080386, date: 24 December 2018). Written informed consent was obtained from all participants prior to enrollment. The consent process included a detailed explanation of the purpose of the study, procedures, risks, and of the right to withdraw at any time without affecting their medical care. Participants were assured of confidentiality and that data would be used for research purposes only. Participation was voluntary, and the confidentiality of data was ensured. The study was conducted in accordance with the Declaration of Helsinki.

### Procedure

Permission to use the EORTC QLQ-C30 and QLQ-BR23 questionnaires was obtained from the main author. A female researcher approached eligible women in oncology clinic waiting areas, provided a brief explanation of the study obtained written informed consent, administered the questionnaires to obtain implicit consent through completion, and collected them immediately, while maintaining participant confidentiality and anonymity. Trained research assistants fluent in Arabic ensured accurate interpretation and documentation of responses, particularly for participants with limited literacy or visual impairments.

### Statistical Analysis

Data were analyzed using SPSS version 24. Descriptive statistics were used to summarize socio-demographic and clinical characteristics and QoL scores. Instrument reliability was assessed using Cronbach's $\alpha$. Independent t-tests, one-way alaysis of variance, and multivariate linear regression identified predictors of QoL scores. All statistical analyses were two-sided, with $p<0.05$ considered statistically significant.

## Results

### Comparison of Baseline Characteristics

At baseline, independent-samples t-tests revealed no statistically significant differences in QLQ-C30 or QLQ-BR23 scores between patients. These findings confirm baseline homogeneity, bolstering internal validity for assessment.

### Participant Characteristics

The study included 200 participants (mean age 48.0±8.3 years; range 26–69 years), most of whom were married housewives with secondary education or less (58%). The mean monthly household income was 348.7±209 Jordanian Dinar, with 74% having medical insurance. Detailed socio-demographic and clinical characteristics are presented in Tables 1 and 2 (QoL scores overview).

Further analysis of QLQ-C30 and QLQ-BR23 data revealed distinct patterns in patient functioning and symptom burden.

### EORTC QLQ-C30 Findings

On the QLQ-C30, patients reported the highest functioning in the role and social domains, whereas emotional functioning was considerably lower. Insomnia, fatigue, and pain were the most prevalent symptoms, with financial difficulties also a notable concern.

### EORTC QLQ-BR23 Findings

The breast cancer-specific QoL assessment indicated relatively higher scores for sexual functioning and body image. However, patients reported the lowest scores in future perspective, reflecting concerns about their long-term health and prognosis. Key symptoms related to breast cancer and its treatment included hair loss, arm symptoms, and systemic therapy side effects, which highlight treatment-related toxicities.

### Predictors of QoL

As shown in Table 3, a multivariate linear regression analysis identified two significant independent predictors of QLQ-C30 global QoL: younger age [positively associated, β = (-0.152), $p<0.05$] and total breast symptoms [negatively associated, β = (-0.280), $p<0.05$] for both tools. Other clinical variables, such as cancer stage and chemotherapy dose, were included in the model but were not statistically significant independent predictors in this baseline analysis.

**Table 1. Socio-demographic characteristics of the sample (*n* = 200)**

| | Baseline QLQ-C30 | | | Baseline QLQ-BR23 | | |
|---|---|---|---|---|---|---|
| **Patient group** | **Mean (SD)** | **Test statistic** | ***p*-value** | **Mean (SD)** | **Test statistic** | ***p*-value** |
| Control | 58.96 (19.8) | t(198) = 1.13 | 0.257 | 24.67 (9.3) | t(198) = 0.960 | 0.340 |
| Intervention | 55.82 (19.3) | | | 23.36 (10.2) | | |
| Age (years) | | | | | | |
| 26-36 years | 57.95 (16.5) | f(3,196) = 0.10 | 0.984 | 23.97 (11.2) | f(3,196) = 1.40 | 0.249 |
| 37-46 years | 57.87 (18.8) | | | 24.87 (9.7) | | |
| 47-56 years | 56.72 (20.8) | | | 22.41 (9.2) | | |
| ≥57 years | 57.68 (20.5) | | | 26.05 (10) | | |
| Educational attainment level | | | | | | |
| Literacy | 56 (17) | f(2,197) = 0.15 | 0.864 | 21.86 (8.3) | f(2,197) = 1.02 | 0.362 |
| Secondary and less than high school | 58.01 (19.2) | | | 23.80 (9.9) | | |
| Diploma, bachelor/higher | 56.73 (21.4) | | | 25.19 (9.9) | | |
| Patients employment status | | | | | | |
| Housewife | 57.76 (19.3) | f(2,197) = 1.83 | 0.163 | 23.95 (9.7) | f(2,197) = 1.20 | 0.303 |
| Private sector employed | 64.59 (18.5) | | | 28.23 (8) | | |
| Government employed | 51.03 (21.9) | | | 22.49 (10.3) | | |
| Marital state/social state | | | | | | |
| Never married | 61.10 (14.9) | t(31.40) = 0.1.20 | 0.249 | 24.58 (7.1) | t(32.40) = 0.120 | 0.708 |
| Ever married | 56.94 (20.1) | adj. | | 23.94 (10) | adj. | |
| Medical health insurance | | | | | | |
| No | 52.19 (14.1) | t(132.2) = 2.70 | 0.008 | 22.97 (8.9) | t(132.2) = 0.90 | 0.371 |
| Yes | 59.22 (20.9) | adj. | | 24.38 (10 ) | adj. | |

SD: Standard deviation; QLQ-BR23: Quality of life questionnaire-breast cancer 23; QLQ-C30: Quality of life questionnaire-core 30; adj.: Adjective

Table 4 shows that no individual predictor reached significance for QLQ-BR23 (all $p>0.05$), although the overall model was significant. The overall regression model was statistically significant; no individual predictor (including type of surgery or chemotherapy) reached statistical significance independently ($p>0.05$). These findings ensure consistency between the reported statistical data and the summary presented in the abstract.

### Summary of Bivariate Findings

Bivariate analyses confirmed no significant differences in QoL scores by patient group, age, or education. However, significant associations were identified with clinical factors such as smoking history, appetite loss, and nipple discharge, which informed the subsequent multivariate models.

## Discussion and Conclusion

These findings represent the baseline characteristics of participants enrolled in an ongoing RCT. This study assessed QoL among Jordanian women diagnosed with breast cancer and identified a moderate overall impairment, with the greatest burden observed in emotional functioning and treatment-related symptoms, particularly fatigue, insomnia, and pain. These findings are consistent with evidence from the Eastern Mediterranean and Middle East, where breast cancer survivors frequently report compromised QoL driven primarily by symptom burden and disease severity rather than sociodemographic characteristics (4, 17), and are further supported by studies on psychological distress and its associated factors among Jordanian women with breast cancer (18).

**Table 2. Clinical characteristics and associations with QoL scores of the sample ($n$ = 200)**

| | Baseline QLQ-C30 | | | Baseline QLQ-BR23 | | |
|---|---|---|---|---|---|---|
| | Mean (SD) | Test statistic | *p*-value | Mean (SD) | Test statistic | *p*-value |
| History of smoking | | | | | | |
| Active smoker | 50.66 (21.3) | f(2,197) = 4.96 | 0.008 | 21 (7.2) | f(2,197) = 1.31 | 0.273 |
| Past smoker | 45.92 (18.6) | | | 22.44 (11.6) | | |
| Never smoked | 59.31 (19.03) | | | 24.51 (9.7) | | |
| History of loosed appetite | | | | | | |
| No | 59.87 (20.9) | t(161.6) = 3.02 | 0.003 | 24.95 (9.6) | t(161.6) = 2.02 | 0.045 |
| Yes | 51.99 (15.2) | adj. | | 21.99 (9.7) | | |
| Nipple discharge | | | | | | |
| No | 59.53 (19.6) | t(198) = 3.16 | 0.002 | 25.02 (9.5) | t(198) = 2.99 | 0.003 |
| Yes | 48.82 (17) | | | 19.99 (9.6) | | |
| Breast cancer stage | | | | | | |
| 1st | 54.90 (23.1) | f(2,197) = 1.72 | 0.181 | 25.49 (10.9) | f(2,197) = 3.26 | 0.041 |
| 2nd | 59.90 (17.8) | | | 25.46 (9.9) | | |
| 3rd | 54.75 (20.8) | | | 21.93 (9) | | |

SD: Standard deviation; QLQ-BR23: Quality of life questionnaire-breast cancer 23; QLQ-C30: Quality of life questionnaire-core 30; QoL: Quality of life; adj.: Adjective

**Table 3. Multivariate predictors of QLQ-C30 global QoL ($n$ = 200)**

| Predictor | B | SE | β | t(df) | *p*-value |
|---|---|---|---|---|---|
| Constant | 122.458 | 11.196 | | 10.938 | <0.001 |
| Age | -0.359 | 0.145 | -0.152 | -2.475 | 0.014 |
| Total breast symptoms | -3.725 | 0.801 | -0.280 | -4.653 | <0.001 |

Full model: employment $p$ = 0.057, insurance $p$ = 0.051; SE: Standard error; QLQ-C30: Quality of life questionnaire-core 30; QoL: Quality of life

**Table 4. Multivariate predictors of QLQ-BR23 QoL ($n$ = 200)**

| Predictor | B | SE | β | t(df) | *p*-value |
|---|---|---|---|---|---|
| Constant | 48.393 | 5.649 | | 8.567 | <0.001 |
| Total breast symptoms | -0.830 | 0.449 | -0.127 | -1.851 | 0.066 |

Model overall significant; no single strong predictor; SE: Standard error; QLQ-BR23: Quality of life questionnaire-breast cancer 23; QoL: Quality of life

The profound "lived experiences" of specific and challenging treatment side effects, such as chemotherapy-induced oral mucositis, further underscore this significant symptom burden. For instance, fatigue and insomnia are commonly reported as highly distressing symptoms, significantly impacting the daily lives and overall well-being of breast cancer patients (19).

The prominence of fatigue, sleep disturbance, and pain aligns with regional systematic reviews, showing these as the most prevalent and persistent concerns in breast cancer populations (17, 20).

Such symptoms exert cumulative effects on physical, affective, and cognitive functioning, thereby explaining the reduced emotional well-being observed in this cohort. Effective coping strategies, including psychoeducation programs, have proven beneficial in enhancing coping among Jordanian women diagnosed with breast cancer (21). Similar symptom-driven impairments have been consistently reported in studies using the EORTC QLQ-C30 and QLQ-BR23 instruments (14, 22).

Clinical characteristics such as advanced disease stages, mastectomy, and chemotherapy were significantly associated with poorer QoL scores; specific breast- and treatment-related symptoms identified through multivariate regression were also significantly associated with poorer QoL scores. This suggests that the physiological impact of the disease and its interventions is a primary driver of QoL decrements. Indeed, older age, long-term survival, postmenopausal status, and a minimum education level have all been associated with increased pain, further highlighting the complex interplay of factors affecting QoL (4, 22). Further regression analyses identified specific breast-related and treatment-related symptoms—including appetite loss, weight loss, itching, bowel or excretory disturbances, and breast ulceration—as independent predictors of reduced QoL. Comparable findings have been reported in multicenter reference-value studies, which show that symptom severity accounts for substantial variability in QoL outcomes among breast cancer patients (22).

Despite notable emotional and symptomatic impairment, social and role functioning remained relatively preserved—a pattern observed in prior Jordanian and regional studies, possibly reflecting strong family support and cultural coping strategies (23).

Indeed, studies have shown the effectiveness of psycho-education intervention programs in enhancing coping strategies among Jordanian women diagnosed with breast cancer (24).

In collectivist cultures, family engagement in caregiving and decision-making sustains social roles despite compromised physical or emotional functioning—a buffering effect corroborated by prior Jordanian research, though not directly assessed here (23).

Sexual functioning exhibited less impairment than that reported in Western populations. This observation warrants cautious interpretation, as cultural norms related to privacy, modesty, and disclosure may bias self-reporting of sexual health issues, potentially resulting in underreporting rather than genuine absence of impairment (4, 22).

Clinically, these results underscore the need for routine assessments of QoL and symptoms in breast cancer management. Implementing systematic screening for fatigue, insomnia, and pain—coupled with timely referrals to supportive, rehabilitative, and palliative care services—could alleviate symptom burden and enhance patient well-being. Evidence-based approaches, encompassing structured physical activity regimens, psychoeducational initiatives, and targeted pharmacological and non-pharmacological symptom management strategies, have evidenced QoL enhancements in breast cancer cohorts (4, 14, 22). In particular, psychoeducation programs have proven efficacious in strengthening coping mechanisms among Jordanian women with breast cancer. Furthermore, cultural and religious beliefs profoundly influence perceptions of illness and coping mechanisms, often promoting resilience and collective support which can mitigate some psychological distress (24).

In light of Jordan's sociocultural context, supportive interventions incorporating patients' values, beliefs, and spiritual resources could enhance emotional adaptation. Although not evaluated here, spirituality's well-established role in coping among Middle Eastern cancer patients merits further investigation into its influence on QoL (17, 23).

### Implications for Nursing Research

This study underscores the substantial influence of clinical characteristics and symptom burden—particularly fatigue, insomnia, pain, and appetite disturbances—on QoL among Jordanian women with breast cancer. Nursing research should prioritize targeted interventions to alleviate these symptoms, alongside longitudinal and interventional studies that examine symptom trajectories and psychosocial needs and evaluate culturally tailored strategies to promote emotional well-being and overall QoL. Future research should explore the specific impact of various surgical procedures on social health, as distinct breast surgeries may differentially affect QoL, necessitating tailored supportive care strategies. Specifically, the effectiveness of interventions such as cognitive behavioral therapy, aerobic training, music therapy, and resistance training in improving sleep quality among women with breast cancer warrants exploration within the Jordanian cultural context.

### Study Limitations

This study has several limitations, including its cross-sectional design, which precludes causal inferences; single-center

recruitment, which limits generalizability; and reliance on self-reported data, which may introduce response biases influenced by cultural norms. Prospective, longitudinal, multicenter studies incorporating validated measures of social support, coping mechanisms, and spiritual well-being are recommended. This analysis reports only baseline data; intervention effects will be examined in subsequent publications from the ongoing RCT.

This study reveals moderate impairment in QoL among Jordanian women with breast cancer, particularly in emotional functioning and treatment-related symptoms. Symptoms—especially fatigue, insomnia, pain, and breast-specific ones—emerged as the primary drivers of reduced QoL, outweighing sociodemographic factors. Clinical factors, such as disease stage and treatment type, also contributed to QoL variations. These findings underscore the need for routine symptom monitoring and culturally sensitive supportive nursing practices in breast cancer care to enhance patient-reported outcomes. The baseline data reported here will inform the interpretation of intervention effects in the ongoing RCT.

**Ethics**

**Ethics Committee Approval:** Ethical approval was obtained from the Jordan Ministry of Health's local ethical research committee (ethics committee no: 9694, date: 05.07.2018) and Universiti Sains Malaysia (protocol code: USM/JEPeM/18080386, date: 24 December 2018).

**Informed Consent:** Written informed consent was obtained from all participants prior to enrollment.

**Footnotes**

**Authorship Contributions**

Surgical and Medical Practices: Mo.A., M.Y., J.A.S., F.M.A., A.A., A.M., M.A., B.A., S.A-Q.; Concept: Mo.A., M.Y., J.A.S., F.M.A., A.A., A.M., M.A., B.A., S.A-Q.; Design: Mo.A., M.Y., J.A.S., F.M.A., A.A., A.M., M.A., B.A., S.A-Q.; Data Collection and/or Processing: Mo.A., M.Y., J.A.S., F.M.A., A.A., A.M., M.A., B.A., S.A-Q.; Analysis and/or Interpretation: Mo.A., M.Y., J.A.S., F.M.A., A.A., A.M., M.A., B.A., S.A-Q.; Literature Search: Mo.A., M.Y., J.A.S., F.M.A., A.A., A.M., M.A., B.A., S.A-Q.; Writing: Mo.A., M.Y., J.A.S., F.M.A., A.A., A.M., M.A., B.A., S.A-Q.

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