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ORIGINAL ARTICLE

Loneliness among women with rheumatoid arthritis: a cross-cultural study in the Netherlands and Egypt

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Abstract The objective of this study was to explain loneliness as experienced by women with rheumatoid arthritis (RA) in a cross-cultural context. We studied 36 Egyptian female RA patients and 140 female Dutch RA patients.. Self-report data were collected about loneliness, physical and psychological health status, social support and social network, needs for help, attitudes and feelings of guilt. Loneliness was significantly higher among Egyptian (44.2± 32.3) than Dutch (12.9±18.9) female RA patients (F=54.3, p<0.001). In Egypt, 36% of the variance of loneliness could be explained by worse affect (anxiety and depression; β=0.51), fewer children (β=0.31), and higher negative social support for the patients (β=0.28) in multiple regression analysis. In the Netherlands, 35% of feeling lonely could be explained by worse affect scores (β=0.52), less positive social support for the patients (β=0.24), and a higher degree of disability (β=0.21). Age of the patients and disease duration only explained 4% and 3% of the loneliness of RA patients in Egypt and the Netherlands, respectively. Female Egyptian RA patients experienced more loneliness than Dutch patients. Affect is the most important and constant variable in explaining loneliness in both countries. The role of the family in perceived loneliness is greater in Egypt than the Netherlands. Low social support received by patients is important in explaining loneliness in the Netherlands but not in Egypt.

Keywords Cross-cultural study · Egypt · Loneliness · Netherlands · Rheumatoid arthritis

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Introduction

Loneliness is a universal phenomenon [1], a prevailing experience, which every person has experienced [2], and whose pain is intensified by chronic or terminal illness [1, 3]. In the 1970s, new interest arose in the field of loneliness and health. There were a few theoretical papers, but little evidence to support or contradict them [4]. Likewise, there have been accepted beliefs, usually inferred from observation or clinical experience, about the effects of loneliness on physical and mental well-being. Only in the last two decades has there been a hint of the potential long-term effects of loneliness on health [5].

Loneliness often results from the interaction of personal factors and situational constraints [2, 6]. Loneliness is the unpleasant experience that occurs when a person's network

of social relations is deficient in some important way, either quantitatively or qualitatively [7]. The obscure nature of loneliness was described as a relatively ambiguous internal state lacking a single unique set of defining cognition, emotions, or behavior [8]. Weiss argued that loneliness is not caused by being alone, but by being without some definitely needed relationship or set of relationships. He divided loneliness into two types: emotional loneliness, characterized by the absence of an attachment figure, and social isolation, manifested by the absence of a social network [9].

Loneliness is an expression of an individual's relationship with his or her community [10]. It is experienced not only when there is a lack of human relationships, but also when these relationships are abundant but unsatisfactory [11]. Loneliness is a double-edged sword. Creative people need loneliness and solitude to produce something new, but negatively experienced loneliness may provoke depression, anxiety, low self-esteem, shyness, lack of social skills, poor health, and even death [12–15]. Many studies have shown specific powerful negative effects of loneliness on survival after myocardial infarction [16], metastatic breast cancer [17], and malignant melanoma [18]. Several investigations have also shown affected immune function in humans and other primates after disruption of social ties (bereavement, divorce, and marital estrangement in humans) [19–21].

Lonely persons seem more inclined to be introspective and become conscious of their feelings of depression and low self-esteem [22]. One of the major obstacles to achieving effective coping strategies is that people are not always ready to recognize or admit that they are lonely [23]. The widespread prevalence and negative social implications of loneliness suggest a need for further research into the accurate detection of the lonely and an understanding of perceived loneliness.

As loneliness is an expression of one's relationship with his or her own community, it is possible that cultural differences and the variety of ways in which people's social relations are organized, will result in cross-cultural variations in the way people experience and cope with loneliness [10]. In the light of the growing awareness that research conducted in Western cultures does not necessarily represent the psychology of non-western populations [24], it is useful to explore how loneliness is experienced in other cultures [10].

Although loneliness has been discussed in other diseases, it has never been discussed in relation to rheumatoid arthritis (RA) patients. This study is therefore an attempt to understand loneliness in patients with RA by investigating how much it is experienced in two completely different cultures and its relationship to disease parameters, the physical condition, and psychosocial situation of the patient.

Materials and methods

Patients

In the Netherlands, ten rheumatologists from three hospitals asked consecutive outpatients satisfying at least four of the 1987 ACR criteria for RA [25] to participate in a study on informal care [26]. The patients should neither be residents in a nursing home nor have disease duration of less than 5 years. A composite questionnaire was posted to each participating patient. Two weeks later, an assistant, who helped with their completion if necessary, collected the questionnaires. The hospitals were in diverse parts of the country; one serves an urban population, one a largely rural population, and one a mixed population. Of the 252 patients who were asked to participate in this study, 23 were excluded (12 had refused, 5 could not be reached, 4 were unable to fill out the questionnaire, and 2 did not fulfill the inclusion criteria). Included in the study were140 women and 89 men.

In Egypt, Minia University Hospital was involved in this study. It serves both the urban and the rural population in this region. The same questionnaire as used in the Dutch group was applied after translation into Arabic. The first author (TMEM) asked consecutive outpatients satisfying at least four of the 1987 ACR criteria for RA [25] to participate in the study. He helped them to fill in the questionnaire, as most of the patients were illiterate. A total of 47 patients were asked to take part in the study; 5 patients refused as they were too busy, and 2 were excluded, as they did not fulfill the criteria. There were 36 women and 4 men included in the study. There was no disease duration limit as in the Dutch group. None of the patients was a resident in a nursing home. As the number of males in the Egyptian group was very small, it was decided that male patients from both Dutch and Egyptian groups be excluded.

Methods

The questionnaires for patients included sections on patient characteristics, health status, and social support.

Patient characteristics included age, disease duration, marital status, hobbies, level of education, and family income. It was noticed that the comparison between the two cultures is very difficult with regard to the last two aspects. In both countries, level of education was categorized into three groups: illiterate; low (≤basic school); high (>basic school). In both countries, basic school takes 6 years.

Comorbidity was measured with a scale from the AIMS2 [27, 28]. Ten *comorbidities* were listed to be checked as applicable. These were hypertension, heart disease, diabetes, cancer, alcohol or drug problems, lung disorders, kidney disorders, liver disorders, stomach disorders or ulcers, and hematological disorders. Respondents could

also check 'other comorbidities' and describe these themselves. The number of comorbidities was used as a variable in the statistical analysis.

Loneliness was measured by a 100-mm visual analog scale (VAS), ranging from 0 (not lonely) to 100 (very lonely) [26]. The combined *affect* scale of the AIMS2 [27, 28] was used to assess the patient's psychological state regarding anxiety and depression. *Disability* was assessed by the modified-HAQ [29], while *pain* was measured by a 100-mm VAS, ranging from 0 (no pain) to 100 (severe pain) [30].

To measure *social support*, the Social Support List—Interactions (SSL12-I) was used [31]. This list is intended to detect beneficial support, to which the patient has access. It comprises four questions on daily support (e.g., "How often do people come to visit you?"), four questions on support in connection with problems (e.g., "How often do people offer you help in exceptional circumstances, such as during illness or when you are moving house?") and four questions on support for self-esteem (e.g., "How often do people give you compliments?"). The score on the individual questions ranged from 1 (seldom or never) to 4 (often). The overall score on the scale was the average of the scores for all 12 questions.

Problematic social support was measured with a scale developed by Revenson et al. [6]. Problematic support describes support perceived as nonsupportive, even though the provider's actions may have been well intended. Support may be perceived as problematic, for example, when it is neither desired nor needed, or when the type of support offered does not match the recipient's needs, e.g., "Does it happen that people give you information or make suggestions which you find unhelpful or upsetting?" The score for the scale was calculated by averaging the scores on each question, which range from (seldom or never) to 4 (often). Both positive support and problematic support scores ranged from 1 (low support) to 4 (high support).

Two estimations of the *social network* were used: the number of children living in the neighborhood and the number of friends in the neighborhood with whom the patient had regular contact. Both numbers were used separately in the analyses.

A self-designed scale comprising four items measured *feelings of guilt*. This scale assesses feelings of guilt that are related to the arthritis condition only and that appeared after the beginning of arthritis, e.g., "I feel guilty that I have arthritis". Each item presents a statement, with which the respondent may agree or disagree. The scores assigned to the possible responses range from 1 for totally disagree, which corresponds to no feelings of guilt, to 5 for totally agree, which corresponds to high feelings of guilt. The overall score for the scale was calculated by averaging the scores on the four items.

Need for help was determined with a list of 28 activities. For each activity, the respondent could answer whether help was needed. The total number of activities for which help was needed was also assessed. The 28 activities included 14 Activities of Daily Living (ADL) and 14 household activities [26].

Attitude towards the help received was assessed with four items. An example of an item is "I find it annoying that I need so much help". The scores assigned to the possible responses range from 1 for totally agree to 5 for totally disagree. The overall score for the scale was calculated by averaging the scores on the four items.

The internal consistency reliability of the scales used in our study, for both the Egyptian and Dutch patients, is shown in Table 1.

Statistical analysis

Data analysis was done by the Statistical Package of the Social Sciences (SPSS for windows NT, SPSS, 2000). The outcomes of the nominal variables of the Egyptian group were compared with those of the Dutch by the chi-square test, and for interval variables, these comparisons were carried out by the Student's t test. Differences between Egyptian and Dutch patients in the mean response for disability (M-HAQ), pain, degree of loneliness, social support variables, need for help, feelings of guilt and affect (anxiety and depression) were analyzed by analysis of covariance (ANCOVA) to control for age and disease duration. Pearson product moment correlation was used to test for significant correlations between loneliness, on one hand, and each of patient characteristics, disease variables, psychological status, social support, social network, need for help, feelings of guilt and attitude towards help, on the other hand. The determinants of loneliness were analyzed for each of the Egyptian and Dutch groups separately by multiple linear regression, with loneliness as the dependent variable. Among the independent variables, age and disease duration were entered in the first block (method forced entry) in the regression analyses, while other independent variables that correlated significantly with degree of loneliness at $p \leq 0.10$ level were entered (methods stepwise) in the second block. This level was chosen not to miss any

Table 1 Internal consistencies (Cronbach's α) of the scales used in both populations

Scale	Egypt	Netherlands
Modified HAQ	0.92	0.90
AIMS-2 depression	0.73	0.82
AIMS-2 anxiety	0.78	0.88
Social support (SSL-12-I)	0.85	0.82
Problematic social support	0.74	0.66
Feelings of guilt	0.73	0.71
Attitude towards help	0.90	0.89

significant correlation due to the small sample size of the Egyptian study sample. Checks for multi-colinearity were done by the variance inflation factors (VIF) for the predictors [32]. It is generally assumed that if any VIF exceeds 10, then there is a multi-colinearity problem [33].

Ethics The Ethics Committee of the Medisch Spectrum Twente Hospital in Enschede, the Netherlands and that of El-Minia University Hospital, Egypt, approved the study.

Results

All women from both groups were included in the analysis, 36 Egyptians and 140 Dutch RA patients. Table 2 shows the patient characteristics of both groups. The mean age was 41.2 (SD 10.8) years for the Egyptian group and 63.2 (SD 11.8) years for the Dutch group, while the mean disease duration was 7.1 years (SD 6.2) for the Egyptian patients and 19.7 years (SD 10.9) for the Dutch patients. In the Egyptian group, 69.4% were married, compared with 62.1% in the Dutch group who were married or living with a partner, which is not a statistically significant difference. The level of education, membership in support groups, and hobbies however differed significantly between both groups ($p<0.001$). More than half the Egyptian patients were illiterate (55.6%), while more than half the Dutch patients had more than basic school education (62.9%). None of the Egyptian patients was a member of a support group (these do not exist in Egypt), while 44.3% of Dutch patients were. Hobbies were mentioned by 13.9% of the Egyptian RA patients, compared with 84.3% of the Dutch patients. One or more comorbidities were present in 50.0% of the Egyptian and 46.0% of the Dutch patients (Table 2), which is not a statistically significant difference.

As the Dutch patients were significantly older and had longer disease duration than the Egyptian patients ($p<0.001$), analysis of the covariance (ANCOVA) was used to adjust for these differences when comparing both groups in study variables. Egyptian RA patients were less disabled, with a mean M-HAQ of 1.6 (SD 0.7), compared to a mean M-HAQ of 2.0 (SD 0.7) in the Dutch group. This difference however was not significant after controlling for age and disease duration ($F=0.62$, $p>0.05$) by ANCOVA. Pain as perceived by patients was not different between both countries (Table 2).

Other study variables were compared between the two groups, adjusting for differences in age and disease duration, as shown in Table 3. Female Egyptian RA patients experienced significantly more loneliness (mean 44.2, SD 32.3) than Dutch patients (mean 12.9, SD 18.9; $F=45.3$, $p<0.001$), as well as higher feelings of guilt ($F=18.4$, $p<0.001$), and worse scores for affect (depression and anxiety; $F=63.9$, $p<0.001$). The Egyptian patients had also significantly more need for help with activities of daily living ($F=36.2$, $p<0.001$) and household activities ($F=4.8$, $p<0.05$) than Dutch patients. The amount of social support or problematic support as perceived by the patients did not however differ significantly between both countries (Table 3).

The correlates of loneliness in both groups

Different variables that may be related to loneliness were tested by correlation analysis for Dutch and Egyptian patients separately (Table 4). Older age was correlated with

Table 2 Patient characteristics of Egyptian and Dutch RA females

Characteristic	Statistic	Egypt ($n=30$)	Netherlands ($n=140$)
Age (years)	Mean±SD	41.2±10.8	63.2±11.8*
Disease duration (years)	Mean±SD	7.1±6.2	19.7±10.9*
Marital status			
Married	Frequency (%)	25 (69.4%)	87 (62.1%)
Unmarried	Frequency (%)	11 (30.6%)	53 (37.9%)
Education			
Illiterate	Frequency (%)	20 (55.6%)	0 (0.0%)**
Low (≤basic school)	Frequency (%)	10 (27.8%)	52 (37.1%)
High (>basic school)	Frequency (%)	6 (16.6%)	88 (62.9%)
Hobbies			
Yes	Frequency (%)	5 (13.9%)	118 (84.3%)**
No	Frequency (%)	31 (86.1%)	22 (15.7%)
Comorbidity			
None	Frequency (%)	18 (50.0%)	59 (44.0%)
1	Frequency (%)	14 (38.9%)	58 (43.3%)
2 or more	Frequency (%)	4 (11.1%)	17 (12.7%)
Modified HAQ	Mean±SD	1.6±0.7	2.0±0.7***
VAS pain	Mean±SD	51.0±27.6	47.7±18.3

M-HAQ Modified health assessment questionnaire, *VAS pain* Visual Analog Scale for pain.
*$p<0.001$ by t test
**$p<0.001$ by chi-square test
***$p\leq0.01$ by t test, difference not statistically significant by ANCOVA controlling for age and disease duration

Table 3 Comparison[a] between Egyptian and Dutch female RA patients in study variables

Variable	Egypt (n=36) Mean±SD	Netherlands (n=140) Mean±SD	F	p
Loneliness	44.2±32.3	12.9±18.9	45.3	<0.001
Total positive support	2.5±0.6	2.4±0.5	0.1	NS
Problematic social support	1.8±0.7	1.8±0.6	3.7	NS
Affect	5.3±1.8	3.8±1.6	63.9	<0.001
Feelings of guilt	2.9±1.0	1.8±0.9	18.4	<0.001
Need for help with ADL	6.5±4.4	3.2±2.7	36.2	<0.001
Need for help with HA	7.9±4.2	6.7±3.6	4.8	0.03

[a] Differences between Egyptian and Dutch patients were analyzed by univariate analysis of covariance (ANCOVA) with age and disease duration as covariates.
Affect Anxiety and depression, *ADL* activities of daily living, *HA* household activities

more loneliness in Dutch (r=0.21, p<0.05), but not Egyptian women with RA (r=−0.07, p>0.10). Similarly, low income was correlated with loneliness in the Dutch patients (r=−0.30, p<0.01), but it had no association with loneliness in the Egyptian patients (r=0.09, p>0.10). Unmarried patients were lonelier than married patients, both in Egypt (r=−0.43, p<0.01) and in the Netherlands (r=−0.25, p<0.01), while the level of education was not significantly correlated with loneliness in either country.

Disease duration and the number of comorbidities were not significantly related to loneliness in both countries. Both disability (M-HAQ; r=0.21, p<0.05) and pain (r=0.20, p<0.05) were significantly correlated with loneliness in the Dutch RA patients, while only pain (r=0.43, p<0.01), but not disability (r=0.06, p>0.10), was correlated with loneliness in the Egyptian RA patients.

Among the psychological variables, affect (anxiety and depression) was strongly correlated with loneliness both in Egypt (r=0.50, p<0.01) and the Netherlands (r=0.37, p< 0.001), while feelings of guilt were correlated with loneliness in the Netherlands (r=0.22, p<0.01), but not in Egypt (r=0.10, p>0.10).

Regarding the social network, the number of children showed a significant negative correlation with loneliness in the Egyptian group (r=−0.41, p<0.01), whereas in the Dutch group, the number of friends was negatively correlated with loneliness significantly (r=−0.18, p<0.01).

Problematic social support was associated with loneliness in Egypt (r=0.30, p<0.10) and the Netherlands (r= 0.27, p<0.01), while low social support was associated with loneliness in the Netherlands (r=−0.28, p≤0.01), but not in Egypt (r=0.01, p>0.10).

The need for help with household activities (r=0.18, p< 0.05), but not with activities of daily living (ADL), was significantly correlated with loneliness in the Netherlands, while neither the need for help with household activities nor with ADL were significantly correlated with loneliness in Egypt. In both groups, the patient's attitude towards help was not significantly correlated with loneliness.

Finally, there was no significant correlation between loneliness and the presence or absence of hobbies in either group.

Table 4 Pearson correlations of loneliness with study variables

Variable	Egypt (n=36) r	Netherlands (n=140) r
Age	−0.07	0.21**
Marital status	−0.43***	−0.25***
Education	0.13	−0.08
Income	0.09	−0.30***
Disease duration	0.16	0.02
Comorbidities	−0.08	0.07
Disability	0.06	0.21**
VAS pain	0.43***	0.20**
Affect	0.50***	0.37****
Feelings of guilt	0.10	0.22***
Number of children	−0.41**	0.15
Number of friends	−0.11	−0.18**
Total positive support	0.01	−0.28***
Problematic social support	0.30*	0.27***
Need for help with ADL	0.01	0.09
Need for help with HA	0.13	0.18**
Patient attitude toward help	−0.26	0.09
Hobbies	−0.02	−0.01

M-HAQ Modified Health Assessment Questionnaire, *VAS pain* Visual Analog Scale for pain, *affect* anxiety and depression.
*p<0.10
**p<0.05
***p<0.01
****p<0.001

Variables explaining loneliness in both groups

To determine which variables were most important in explaining the variance in the loneliness scores, a multiple linear regression analysis was carried out based on the results of the correlations.

Age and disease duration were entered first (forced entry) to control for the effects of these variables. Other variables showing significant correlation ($p<0.10$) with loneliness scores were entered (method stepwise) in the second block. These variables were: marital status, patient income, disability (M-HAQ), VAS pain, affect (depression + anxiety), number of children, number of close friends, social support, problematic support, feelings of guilt, need for help with household activities, and the attitude of the patient towards help

In Egypt, age and disease duration explained only 4% of the variance of loneliness scores of the RA patients (β=−0.12 and 0.19, respectively), which was not significant. Affect explained 22% (β=0.51), the number of children explained 8% (β=−0.31), and problematic support explained 6% of the variance of loneliness (β=0.28). Therefore, factors other than age and disease duration significantly explained 36% of the variance of loneliness scores in Egyptian female RA patients. This analysis showed that with worse affect, fewer children, and more problematic support, women with RA in Egypt feel lonelier (Table 5).

In the Netherlands, age and disease duration explained an insignificant 3% of the variance of loneliness scores of the RA patients (β=−0.17 and 0.006, respectively). Affect could explain 26% (β=0.52), social support explained 5% (β=−0.24), and disability scores explained 4% of loneliness scores (β=0.21). Therefore, variables other than age and disease duration significantly explained 35% of loneliness feelings in the Dutch RA patients. This analysis showed that with worse affect, low social support, and more disability, women with RA in the Netherlands feel lonelier (Table 6).

Discussion

Loneliness is a universal experience, intensified by chronic illness [1]. In a recent study among older persons with different chronic diseases, patients with lung disease and arthritis had the greatest feelings of loneliness [3]. However, loneliness has not been investigated in rheumatoid arthritis from a cross-cultural perspective. In fact, only few cross-cultural studies on loneliness have been published [34, 35]. Although such research is important [35], given that cultural background may influence coping with loneliness [10], to our knowledge, this is the first study comparing loneliness in rheumatoid arthritis patients from two different cultures. In Dutch and Arabic, the equivalent words have the same meaning as the English word "loneliness". We did not look at the meaning of the word loneliness but especially studied the intensity of loneliness and how loneliness was experienced in the relationship with other measures. We compared RA patients presenting to the rheumatologist in both countries. Therefore, neither study group may be representative of RA as seen in the community. Socioeconomic factors, particularly in the Egyptian group, can influence the patient's decision to seek rheumatological care. Poor, mainly rural patients usually prefer to go to the university hospital, as treatment is free, while more affluent patients may go to a private rheumatology practice. Consequently, the majority of Egyptian patients in this study were poor and illiterate.

A major problem in health measure research is producing adequate measures in more than one language to be applied in cross-cultural studies [36]. Where an instrument is developed in one country, it might not be suitable in

Table 5 Significant factors related to loneliness as experienced by RA patients in Egypt[a]

Loneliness	Model 1			Model 2			Model 3			Model 4		
	β	R^2 Change	F	β	R^2 Change	F	β	R^2 Change	F	β	R^2 Change	F
Block 1 (forced entry)												
Age	−0.12			−0.13			−0.04			0.09		
Disease duration	0.19	0.04	0.7	0.01			−0.01			−0.02		
Block 2 (stepwise)												
Affect				0.51*	0.22	9.7**	0.44*			0.40*		
Number of children							−0.31	0.08	3.9*	−0.31		
Problematic support										0.28	0.06	2.9*

Total R^2 =0.40
Adjusted R^2 =0.30
F=4.0, $p<0.01$

[a] Multiple linear regression analysis was carried out with loneliness as the dependent variable. Age and disease duration were entered in the first block (method forced entry). Other variables with significant correlation ($p\leq0.10$) with loneliness were entered in the second block (stepwise).
*$p\leq0.05$
**$p\leq0.01$

Table 6 Significant factors related to loneliness as experienced by RA patients in the Netherlands[a]

Loneliness	Model 1			Model 2			Model 3			Model 4		
	β	R^2 Change	F	β	R^2 Change	F	β	R^2 Change	F	β	R^2 Change	F
Block 1 (forced entry)												
Age	0.17			0.08			0.04			0.03		
Disease duration	0.01	0.03	1.4	0.02			0.03			−0.02		
Block 2 (stepwise)												
Affect				0.52**	0.26	32.3**	0.46**			0.42**		
Social support							−0.24	0.05	7.0*	−0.26*		
Disability (M-HAQ)										0.21*	0.04	5.7*

Total R^2 =0.38
Adjusted R^2 =0.34
F=10.7, p<0.001
[a] Multiple linear regression analysis was carried out with loneliness as the dependent variable. Age and disease duration were entered in the first block (method forced entry). Other variables with significant correlation (p<0.10) with loneliness were entered in the second block (stepwise).
M-HAQ Modified Health Assessment Questionnaire
*p≤0.05
**p≤0.001

others [37]. The translated questionnaires had been validated in English and most also in Dutch, but not yet in Arabic. The equivalent internal consistencies of the scales used in our study indicate that they have cross-cultural reliability, at least where the two included populations are concerned.

The two groups of patients were comparable in terms of marital status, comorbidities, and pain. However, Egyptian female RA patients were significantly younger, had shorter disease duration, less education, fewer hobbies, and less disability than their Dutch counterparts. The significantly younger age and shorter disease duration of Egyptian patients in comparison with Dutch patients has been reported before [38] and can be explained on the basis of a younger age at onset of the disease in Egypt, as seen in other developing countries [39]. The different population age structures and life expectancy, as well as differences in hormonal and environmental factors were offered as explanations for the earlier onset of RA in Egypt [38]. Older age was correlated with loneliness in Dutch, but not Egyptian, patients, possibly because they were much younger. In a recent study examining the influence of age on loneliness, seniors (above 60) experienced the highest levels of loneliness among the four examined age groups (2). A few Egyptian patients included in this study were seniors.

Differences in education and hobbies were as expected, with each group reflecting the social and cultural characteristics of the population at large in these aspects. Though RA may have a detrimental effect on many areas of life including mood, emotions, social life, social relationships, and hobbies [37], most Egyptian patients included in this study had no hobbies to begin with. Women in Egypt have a lot of problems to fulfill their daily chores, and no time, nor financial possibility to indulge in hobbies. The situation may be different in more affluent or urban women, but these were not represented in this series. The higher disability of the Dutch group can be explained by the significantly older age and longer disease duration of those patients, with a mean difference from the Egyptian group of 22 years in age and 12 years in disease duration. When matched series of RA patients from these two particular countries were compared, disability was actually higher in Egyptian patients [40].

Despite having less disability scores than Dutch patients, Egyptian patients needed more help with household activities and ADL. This could be a reflection of the different ways these activities are performed in the two countries. A Dutch patient uses several household appliances and may resort to assistive gadgets, orthosis, and environmental manipulation devices when she is more disabled, while in rural Egypt, manual work is the norm, and vacuum cleaners, raised toilet seats, and bathtub elevators are either too expensive or unheard of. Another explanation could be that the self-efficacy of Egyptian patients in coping with their disease may be different from Dutch patients. Self-efficacy has not been examined in Egyptian RA patients, but a recent study has shown that the need for help in Dutch RA patients is dependent on their self-efficacy expectations towards coping with their disease [26].

One cannot exclude some bias due to the fact that, in Egypt, the illiterate patients were interviewed. It is reassuring that neither positive nor problematic support were different between the two groups.

Guilt and affect (anxiety and depression) were significantly worse in the Egyptian group. Feelings of guilt could

be one of the symptoms of depression in this group. In a previous study, 23% of Egyptian RA patients were found to be clinically depressed in comparison with 10% of the controls [41]. Depression was significantly predicted by being unmarried and higher disability scores in Egyptian RA patients [41].

Female Egyptian RA patients were lonelier than their Dutch counterparts, even after controlling for differences in age and disease duration. This result may seem surprising given that the Egyptian society has stronger ties in-between its members and extended families are common, especially in rural areas. However, loneliness is not simply the absence of others, but the deficiency of needed relationships [9], either quantitatively or qualitatively [7]. It can also occur when there are abundant, but unsatisfactory human relationships [11]. Loneliness is therefore dependent on the individual's needs and expectations. The findings of the study indicate that loneliness arises differently in the Egyptian and Dutch groups, depending on what they need and expect in social relationships. In Egyptian RA females, it is the deficiency of those strong family ties and relationships that the patient expects and needs most, both quantitatively (fewer children) and qualitatively (problematic support), which together with a worse affect, result in feelings of loneliness. An Egyptian rural female included in this study is mostly a housewife, illiterate or with low education, spending most of her time at home, and having a few hobbies outdoors. She becomes dependent on her family members, especially her husband and children, when she gets a painful disabling disease like RA. When she is unmarried or has fewer children or when her expectations regarding empathy and support are frustrated by problematic support, it is not surprising that she will feel lonely. A worse affect, fewer children, and problematic support therefore plausibly explain a significant amount of the feelings of loneliness in an Egyptian RA female. The expectations of a Dutch female on the other hand are rather different. With a higher level of education, more often an outside job, more friends and hobbies, a significant part of her life is spent outdoors. When she has a painful disabling disease like RA, possibly affecting her job, ability to socialize, and engage in hobbies, she will look for support both outdoors (her friends) and indoors (her husband and to a lesser extent her children, as nuclear families are the norm in the Netherlands). A Dutch female therefore has a more extensive social network, and more resources for support than an Egyptian female, which may explain why she feels less lonely than an Egyptian female. Many variables were therefore found to be significantly correlated with loneliness in Dutch females, low income, being unmarried, fewer friends, pain, disability, worse affect, and lack of positive social support. It is likely however that some of these variables are interdependent (e.g., more disability results in job difficulties, leading to lower income; pain, disability, or worse affect causing the patient to refrain from engagement in hobbies), as only a worse affect, more disability, and less social support emerged as the significant predictors of loneliness in Dutch patients in the regression analysis. If we apply Weiss's theory about the types of loneliness [9] on our findings, it would seem that loneliness in Egyptian patients is more of an emotional type, characterized by the absence of, or problematic support from, an attachment figure (family member, mainly children). Loneliness in Dutch patients would be more related to social isolation and a deficient social network, especially in more disabled patients who lack needed social support.

Positive social support may be more needed in Dutch patients than Egyptian patients, who did not show a significant correlation between loneliness and lack of positive support. In a cross-cultural study comparing loneliness between Americans and East (Asian) Indians, loneliness was related to deficiency of the social support network in Americans, while in Indians, it was more influenced by religion, cultural norms, and personal lifestyles that are intertwined with an increased sensitivity and awareness of one's state of being, needs, and resources [42]. This suggests that North Americans, and consequently western cultures, may appreciate and value contributions from social networks more than do people from other cultures. This fits in with our findings that in the Netherlands, lack of positive social support from friends and family is a significant determinant of loneliness, whereas in Egypt, it is mainly the family that counts. To RA patients in Egypt, receiving problematic support is a more important factor contributing to feelings of loneliness, than the diminished social support they might get.

Fewer children were associated with loneliness in the Egyptian RA patients, more than in the Netherlands. This may be explained by the role of extended families, especially in the rural areas in Egypt, where offspring continue to live with or close to their parents, even after growing up and getting married. The role of children may be less evident in a Western society with nuclear families, where it is common for sons and daughters to leave home and live independently at an early age. A recent study found that childlessness per se does not increase loneliness in elderly unmarried Americans generally, but that childlessness is important to analyze in the context of sex and marital status [43].

In the two groups, affect (anxiety and depression) was the strongest predictor of loneliness. The relationship between loneliness and mood is possibly bidirectional. Loneliness is strongly associated with both anxiety and depression [11, 44] and negatively correlated with happiness [45]. In one recent study, loneliness was the strongest predictor of depression [46], while in another; severely

depressed patients had double the risk for loneliness in comparison with mildly depressed patients [47].

In conclusion, Egyptian women with RA are lonelier than Dutch women with RA. Apart from a worse affect being similarly the strongest determinant of loneliness in both groups, loneliness in Egyptian patients is more of an emotional type, experienced by RA patients who have fewer children and more problematic social support. Age, disease duration, affect, number of children, and problematic support together explained 40% of the variance of loneliness scores in the Egyptian group. Loneliness in Dutch patients is more of the social isolation type, which manifest in more disabled RA patients with lack of positive social support. Age, disease duration, affect, disability, and lack of positive support together explained 38% of the variance of loneliness scores in the Dutch group. A large amount of the variance of loneliness remains unexplained in both groups. Further research is needed, focusing on the different dimensions of loneliness as experienced in RA patients and on strategies for coping with loneliness.

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