Gender differences and tuberculosis in the Syrian Arab Republic: patients' attitudes, compliance and outcomes

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الاختلافات بين الجنسين في ما يتعلق بمرض السل في الجمهورية العربية السورية: مواقف المرضى وامتثالهم للمعالجة ونتائج المعالجة

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الخلاصة: أُجريت دراسة استباقية حول الاختلافات بين الجنسين في ما يتعلق بالإصابة بالسل؛ وقد شملت الدراسة 552 من المرضى المشخَّصين حديثاً بناءً على إيجابية اللطاخة في جميع أنحاء الجمهورية العربية السورية بإجراء مقابلة معهم في الفترة بين كانون الثاني/يناير 2002 وتموز/يوليو 2002، ثم متابعتهم حتى نهاية المعالجة. وقد لوحظ أن التأخُّر في التشخيص كان أطول لدى الذكور، وأن هناك اختلافات ملحوظة بين الذكور والإناث من حيث المكان الذي يلتمسون فيه الرعاية. ولو أن الاختلاف بين الجنسين لم يؤثر على المعارف والمواقف لدى المرضى بالسل. ومع أن النساء تحدَّثن عن مزيد من العوائق في وجه التماس الرعاية، فإن امتثالهن للمعالجة كان أفضل من امتثال الرجال، كما كانت معدلات نجاح المعالجة لديهن أعلى بشكل ملحوظ مما لدى الرجال. وقد أظهر التحليل المتعدِّد المتغيرات أن الذكورة منبئ هام بنتيجة علاجية سلبية إذا أُخذت في الاعتبار سائر المتغيرات المتعلقة بالرعاية الصحية وبالنواحي الاجتماعية والديمغرافية.

ABSTRACT In a prospective study of gender and TB outcomes, 552 newly diagnosed smear-positive patients throughout the Syrian Arab Republic were interviewed at recruitment (from January 2002 to July 2002) and followed until the end of treatment. Delay in diagnosis was significantly longer among males. Significant differences between males and females were noted in relation to the place they usually use to seek care. Gender did not seem to affect knowledge and attitudes of TB patients. Although the women reported more barriers to seeking care, compliance with treatment tended to be higher and the treatment success rate was significantly higher among females than males. Multivariate analysis showed that male sex was a significant predictor of a negative treatment outcome, after controlling for other significant sociodemographic and health care related variables.

Sexospécificités et tuberculose en République arabe syrienne : attitudes des patients, observance et issue du traitement
RESUME Dans une étude prospective des sexospécificités et de l'issue du traitement de la tuberculose, 552 patients frottis positif récemment diagnostiqués dans la République arabe syrienne ont été interrogés à leur recrutement (entre janvier 2002 et juillet 2002) et suivis jusqu'à la fin du traitement. Le retard dans le diagnostic était nettement plus important chez les hommes. Des différences significatives entre les hommes et les femmes ont été notées en ce qui concerne l'endroit où ils s'adressent généralement pour bénéficier de soins. Le sexe ne semblait pas influer sur les connaissances et les attitudes des patients tuberculeux. Bien que les femmes aient signalé davantage d'obstacles pour se faire soigner, l'observance du traitement avait tendance à être meilleure et le taux de réussite du traitement était significativement plus élevé chez les femmes que chez les hommes. Une analyse multivariée a révélé que le sexe masculin était un facteur prédictif important d'une issue négative du traitement, après le contrôle d'autres variables importantes sociodémographiques et liées aux soins de santé.

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Introduction

Gender inequality has long been identified as a major determinant that can lead to delay in diagnosis, poor access to health care, lack of compliance and also poor treatment outcomes. Health care seeking and treatment behaviour of men and women suffering from tuberculosis (TB) is largely determined by how they and those around them perceive the symptoms, regard the diagnosis, accept the treatment, and adhere with it. Thus, gender may well influence the detection of the disease and its outcome [1]. Many studies have been conducted in different parts of the world in connection with gender differences in TB [2–8]. These report that, when they seek health care, women are not diagnosed with TB by doctors or other health care providers as often men. They also report that sputum submission rates are different between men and women. However, women are seen as more compliant to treatment than men.

Globally, TB occurs more often in men than in women [1,9]. In most countries with available data, the female to male ratio among prevalent TB cases identified in population surveys is similar to that among notified cases [6]. In the Syrian Arab Republic, the case notification rate suggests that TB may be less frequent among females [10]. In 2001, the ratio of female to male smear-positive TB cases was 1:1.8 [11]. There is no previous research in our country that examined gender-related differences in diagnosis, compliance and treatment outcomes of TB. We thus conducted this study with the following objectives:

- to determine whether there are sex differences in diagnosis, compliance with treatment and/or treatment outcomes of TB patients;

- to identify TB patients' (both men and women) knowledge, beliefs and attitudes towards TB;
- to identify gender-related factors and/or barriers that may influence patients' compliance with TB treatment and utilization of health care services.

Methods

Subjects

This prospective study recruited a total of 552 new smear-positive TB patients seen at all provincial TB centres (14 centres) in the Syrian Arab Republic during the period 2 January 2002 to 31 July 2002. The recruitment occurred when a new smear-positive case of TB was diagnosed. The cohort of patients was followed-up for 6 months until the end of their treatment period.

Data collection

At recruitment, patients were interviewed using a semi-structured questionnaire. The questionnaire was field tested before the study, and necessary changes were made accordingly. The final questionnaire consisted of 70 items; both close-ended and open-ended. The data collected included: background information; detailed clinical information including signs and symptoms and start date; care-seeking behaviour and information on the patient's contacts. Patients were asked about their TB-related knowledge including the mode of transmission and stigma of the disease. Patients' perceptions of gender differences in TB diagnosis and care-seeking behaviour were studied. Data on utilization of health services and patients' satisfaction with the services were also obtained.

The questionnaires were administered by trained health personnel that included

both doctors or paramedics working with the Syrian National Tuberculosis Programme. Fieldwork was supervised to improve the quality of data collection.

Patients' treatment cards were reviewed to collect data on compliance with treatment and examinations and treatment outcome. Compliance with drug treatment was defined as 0 days of missed treatment, i.e. 0/60 days in the initial phase (daily administration), and 0/120 days in the continuation phase of treatment (weekly administration), as seen on the treatment cards.

Treatment outcomes were determined according to WHO definitions [10].

The informed consent of the patient was taken before the interview, and the study proposal was cleared by the relevant ethical review boards.

Statistical analysis

Data from questionnaires were checked before data entry. Missing values were allowed for in the analysis; thus, in some of the tables reported here, the total number of respondents differs from the study sample size. Descriptive statistics were used to examine the subjects' characteristics. For the comparison between sexes, the chi-squared test was used to compare proportions, and the Student t-test was used to compare means. Summation scores for patients' knowledge, gender perceptions and satisfaction with care were calculated. The score was calculated after recoding answers as '1' for correct or positive, and '0' if incorrect or negative.

Treatment outcomes were compared between males and females. Treatment outcomes were then recoded as a dichotomous variable, including 'success of treatment' defined as cure or completed treatment; and 'no success' defined as default, failure or death. Transferred cases were excluded from this analysis. The relative risk (RR) and attributable fraction (RR–1/RR) for determinants of the treatment outcome were then calculated. Multivariate analysis was performed to determine the predictors of treatment outcome; thus adjusted relative risk (RR) and its 95% confidence intervals (CI) were calculated. Variables entered in the model for the multivariate analysis were those significant at the level of 0.1 in the bivariate analysis.

Results

Follow-up status and background characteristics of study subjects

Information was collected from 552 patients seen at TB centres out of a total of 800 new smear-positive patients registered in those centres during the recruitment period of the study. Those who were not recruited included those who refused, were hard to communicate with or who were not seen by the trained interviewers for different reasons. There were 366 (66.3%) males and 186 (33.7%) females. In order to avoid any selection bias, the female to male ratio for the study subjects and for those registered at TB centres were compared. That ratio was also presented by province. No difference was seen in the female to male ratio between registered (1:1.87) and recruited (1:1.97) TB patients.

Most of the study subjects were in the younger age groups: 14.9% were under 20 years and 44.9% aged 20–29 years. One-fifth (20.7%) of the patients had no formal education, while 11.8% had a higher level of education. The mean monthly household income was 6643.5 Syrian pounds (US$ 1 = 53 SP). Table 1 compares the demographic and socioeconomic characteristics of the sexes; significant differences were

Table 1 **Comparison of demographic and socioeconomic characteristics between male and female tuberculosis patients**

Variable	Males (*n* = 366)		Females (*n* = 186)		*P*-value
	No.	%	No.	%	
Age (years)					
< 20	42	11.5	40	21.5	0.002
20–29	167	45.6	81	43.5	
30–39	71	19.4	19	10.2	
40+	86	23.5	46	24.7	
Marital status					
Single	181	49.6	78	42.2	< 0.001
Married	180	49.3	94	50.8	
Other	4	1.1	13	7.0	
Occupation					
Unemployed	41	11.6	122	77.7	< 0.001
Labourer	107	30.4	4	2.5	
Agriculture	49	13.9	10	6.4	
Military	34	9.5	0	0	
Small business	74	21.0	8	5.1	
Clerk	34	9.7	1	0.6	
Other	14	4.0	11	7.0	
Education (years)					
None	58	15.8	56	30.1	< 0.001
1–6	107	29.2	54	20.9	
7–12	157	42.9	55	29.6	
12+	44	12.0	21	11.3	

n = *total number of respondents: data were missing for some categories.*

noted in the age distribution, marital status, level of education and occupation.

TB presentation and health-seeking behaviour

Table 2 shows no significant differences in the clinical presentation of the disease among males and females. The median period between onset of symptoms and reporting to the health facility was 30 days (range 2–1800). The mean number of days of delay was significantly longer for males than females (63.6 days versus 40.0 days, respectively). Significant differences be-

tween males and females were noted in relation to the first place they usually go to seek care (Table 2); a higher proportion of males sought care at public hospitals, and a higher proportion of females sought care from private physicians. It should be noted that 3.1% of study subjects sought care from pharmacies. The period between onset of symptoms and reporting to the health facility was longest for those who sought care from hospitals (mean 71.0 days).

Patients were questioned about their knowledge of TB. Table 3 shows that sex did not seem to be related to knowledge of

Table 2 **Clinical presentation of the disease and health-seeking behaviour of tuberculosis patients according to sex**

Variable	Males (n = 366)		Females (n = 186)		P-value
	No.	%	No.	%	
Clinical presentation					
Cough	352	96.2	183	98.4	0.120
Fever	247	67.5	136	73.1	0.103
Loss of appetite	255	69.7	140	75.3	0.100
Loss of weight	270	73.8	144	77.4	0.203
Blood in sputum	209	57.1	108	58.1	0.451
Place of first visit					
Hospital	71	19.6	14	7.6	0.005
Private physician	241	66.4	149	81.0	
Health centre[a]	32	8.8	15	8.2	
Pharmacy	13	3.6	4	2.2	
Other	6	1.7	2	1.1	
Delay in seeking care (days)					
≤ 30	220	63.6	116	67.8	0.41
31–90	66	19.1	33	19.3	
> 90	60	17.3	22	12.9	

[a]*Includes TB centres.*
n = *total number of respondents: data were missing for some categories.*

TB patients, even after developing a summation score for knowledge (mean knowledge score for males was 2.8 and for females 2.7, $P > 0.05$).

Table 3 also shows that male and female subjects had significant differences in their gender attitudes and perceptions of care-seeking behaviour. Sixty-six out of 70 patients, 41 males, thought that women are inferior to men. Due to the large number of the missing values for this item, the characteristics of respondents and non-respondents' were compared and showed that the non-respondents were from the younger age groups. A large proportion of women (71.3%) reported that they need permission to go to the TB centre and had to be accompanied by someone (86.8%). Overall, the mean gender perception score of males was significantly higher than females (5.0 ± 0.9 versus 3.7 ± 1.2) ($P < 0.001$).

Most patients were satisfied with the service provided at the health centre (99.7% of men versus 97.8% of women) ($P > 0.05$). Slightly more men than women (93.6% versus 87.4%) thought that the visit to the TB clinic was convenient ($P > 0.05$). However, some of them experienced long waiting times: 12.4% of females and 10.9% of males ($P > 0.05$). The mean score for satisfaction with care was higher among men than women (2.8 ± 0.4 versus 2.7 ± 0.5) ($P = 0.02$).

Treatment outcome and its determinants

Table 4 summarizes the differences between females and males in compliance

Table 3 **Tuberculosis knowledge and perceptions according to tuberculosis patient's sex**

Item	Males (*n* = 366)		Females (*n* = 186)		*P*-value
	No.	%	No.	%	
Knowledge					
Knows TB is a transmissible disease	278	77.0	139	79.0	0.607
Knows correct mode of transmission	162	48.1	77	46.7	0.767
Agrees TB is a stigmatized disease	124	37.3	65	39.9	0.586
Agrees stigma differs by sex	28	9.0	21	13.2	0.20
Mean ± *s* knowledge score (max. = 4)	2.8 ± 0.9		2.7 ± 0.9		0.35
Gender perceptions					
Believes one sex is inferior to another	46	19.7	28	24.3	0.323
Believes being a man/woman prevents them from discussing health problems	22	6.0	33	18.1	< 0.001
Believes being a man/woman prevents them from seeking care	9	2.5	17	9.3	< 0.001
Believes being a man/woman prevents them from getting treatment	12	3.3	12	6.6	0.076
Agrees being a man/woman they need permission to go to the health centre	99	28.5	127	71.3	< 0.001
Agrees being a man/woman they need companion to go to the health centre	103	29.3	158	86.8	< 0.001
Mean ± *s* gender perception score (max. = 6)	5.0 ± 0.9		3.7 ± 1.2		< 0.001

n = *total number of respondents: data were missing for some categories.*
s = *standard deviation.*

with treatment and treatment outcomes. Treatment cards of only 528 patients were analysed. The results did not show any sex differences in the adherence rate to the schedule of sputum submission for treatment supervision. The conversion rate to smear negative after 2 months of treatment was 78.6% among males and 77.2% among females ($P = 0.804$). Compliance with drug treatment did not significantly differ between males and females. The mean number days of treatment missed during the 2-month initial phase of treatment was 10.4 ± 11.3 among males and 9.3 ± 8.8 among females. The mean number of days of missed treatment during the 4-month continuation phase of treatment was

39.2 ± 40.8 for males versus 26.8 ± 34.7 for females. The defaulter rate was higher among males than females (8.7% versus 5.8% respectively), but overall there were no significant differences in the distribution of treatment outcomes between males and females (Table 4).

The treatment success rate (that is cure and completion of treatment) was higher among females than males, with no significant difference (90.1% for females versus 85.6% for males). As can be seen from Tables 5 and 6, the success rate was significantly higher among the younger and more literate patients, those who did not report a delay in seeking care after experiencing symptoms, those who adhered with the

Table 4 **Treatment compliance and outcomes among tuberculosis patients according to sex**

Item	Males (*n* = 366)		Females (*n* = 186)		Total		*P*-value
	No.	%	No.	%	No.	%	
Compliance							
Compliant with sputum examination	224	63.6	118	68.2	342	65.1	0.349
Compliant with treatment, initial phase[a]	292	83.7	137	82.0	429	83.1	0.736
Compliant with treatment, continuation phase[a]	235	70.6	114	69.1	349	70.1	0.814
Conversion to smear negative							
Conversion rate after 2 months treatment	250	78.6	125	77.2	375	78.1	0.804
Conversion rate after 3 months treatment[b]	36	52.2	24	66.7	60	57.1	0.224
Outcome[c]							
Cure	238	67.0	122	70.5	360	68.2	0.254
Treatment completed	53	14.9	32	18.5	85	16.1	
Treatment failure	13	3.7	4	2.3	17	3.2	
Default	31	8.7	10	5.8	41	7.8	
Transfer out	15	4.2	2	1.2	17	3.2	
Death	5	1.4	3	1.7	8	1.5	

[a]*0 days of missed treatment.*
[b]*Patients who did not convert after 2 months.*
[c]*WHO definitions [11].*
n = *total number of respondents: data were missing for some categories.*

schedule of the sputum examination and those who complied well with treatment.

Univariate analysis showed that the significant risk factors for a negative treatment outcome (that is default, failure or death) were: illiteracy (2.4-fold increased risk); delay ≥ 3 months in seeking care (2.4-fold increased risk); non-adherence to sputum examination (12.7-fold increased risk); and non-compliance during the initial or maintenance phases of treatment (4.0 and 13.9-fold increased risk respectively) (Table 7). The attributable fraction among those who did not adhere to the schedule of sputum examination was 92.1%; that is the proportion by which the risk of a negative treatment outcome would be reduced if

non-adherence was eliminated. Similarly, the attributable fraction for non-compliance with treatment was very high as well (75.1% for the initial phase and 92.8% for the maintenance phase).

Multivariate analysis (Table 8) showed that, after adjustment for confounders, the significant risk factors for a negative treatment outcome were: male sex (2.9-fold increased risk), illiteracy (4.1-fold increased risk), non-adherence to sputum examination (9.8-fold increased risk) and non-compliance with treatment during the initial or maintenance phases (adjusted RR of 2.6 and 10.8 respectively). Three months or more delay in seeking care was associated with an increased risk of a negative treat-

Table 5 **Sociodemographic determinants of treatment success (cured and completed treatment) among tuberculosis patients**

Variable	Success (n = 445)		Failure (n = 66)		P-value
	No.	%	No.	%	
Age (years)					
< 40	346	89.4	41	10.6	0.009
40+	99	79.8	25	20.2	
Sex					
Male	291	85.6	49	14.4	0.098
Female	154	90.1	17	9.9	
Marital status					
Single	215	90.3	23	9.7	0.130
Married	214	84.3	40	15.7	
Other	15	88.2	2	11.8	
Occupation					
Unemployed	134	88.2	18	11.8	0.570
Labourer	85	84.2	16	15.8	
Agriculture	48	84.2	9	15.8	
Military	28	93.3	2	6.7	
Small industry	69	89.6	8	10.4	
Clerk	28	80.0	7	20.0	
Others	22	91.7	2	8.3	
Education					
Literate	366	89.9	41	10.1	0.002
Illiterate	79	76.0	25	24.0	
House ownership					
Yes	344	88.7	44	11.3	0.060
No	85	81.7	19	18.3	

n = *total number of respondents.*

ment outcome in the bivariate analysis; however, after adjusting for confounders by the multivariate analysis, this proved to have no significant effect in our study.

Discussion

This study hypothesized that sex is a determinant of the diagnosis, compliance and treatment of TB. Our results showed some important gender differentials. To fit our results into the conceptual framework suggested by WHO [1], we will discuss them according to different potential barriers related to gender.

The presentation of symptoms did not differ between males and females. However, symptomatic males took a significantly longer time on average to seek medical care. Due to the delay, it is likely that more severe cases occurred among males and it is therefore not surprising that more males sought care at hospitals.

The summation score for patients' knowledge did not differ between males and females. Males, however, reported better overall scores in terms of gender perceptions; that is, they experienced culturally more favourable circumstances for seeking care when needed. Males were also more satisfied with their care, while women tended to report longer waiting time at TB centres. We cannot assume that this was a result of gender bias by care providers at TB clinics; the finding could also be explained by women's perceptions of time and the time pressure on them at leaving the house and the children. Stigma did not seem to prevent women from seeking care. In this study, however, we were not able to identify any gender bias in the TB service for two reasons: first, we did not study this question due to its sensitive nature, and secondly, because the TB service is only provided by the TB health facilities under the Syrian National TB Programme.

Compliance with treatment and treatment supervision schedules did not significantly differ between males and females, in spite of the much higher proportion of women who need to get permission to go to the health centre and who need to have a companion with them. This study confirmed that women are generally more likely to comply with TB treatment than men,

Table 6 **Health care related determinants of treatment success (cured and completed treatment) among tuberculosis patients**

Variable	Success (*n* = 445)		Failure (*n* = 66)		*P*-value[a]
	No.	%	No.	%	
Place of first visit					
Hospital	68	84.0	13	16.0	0.08
Private physician	322	89.2	39	10.8	
Health centre	33	76.7	10	23.3	
Pharmacy	11	78.6	3	21.4	
Other	8	100.0	0	0	
Delay in seeking care (days)					
≤ 30	281	90.4	30	9.6	0.003[b]
31–90	81	87.1	12	12.9	
> 90	57	77.0	17	23.0	
Compliant with sputum examination					
Yes	332	97.4	9	2.6	< 0.001
No	113	66.5	57	33.5	
Other variables	**Mean ± s**				
Missed treatment, initial phase (days)	0.8 ± 3.14		6.9 ± 12.3		< 0.001
Missed treatment, continuation phase (days)	3.2 ± 9.5		68.1 ± 44.9		< 0.001
Knowledge score	2.8 ± 0.9		2.8 ± 0.8		0.70
Gender perception score	5.0 ± 0.9		3.7 ± 1.2		0.60
Satisfaction score	2.8 ± 0.4		2.7 ± 0.5		0.06
Travel time to health facility (min)	38.7 ± 33.5		42.9 ± 39.7		0.34
Travel cost (SP)	39.1 ± 50.7		51.8 ± 67.7		0.14
Waiting time (min)	18.5 ± 29.9		35.8 ± 54.1		0.15

[a]χ^2*-tests for categorical variables and* t*-test for continuous variables.*

[b]*P*-value from χ^2 for trend.

n = *total number of respondents.*

s = *standard deviation.*

SP = *Syrian pounds.*

despite the fact that they are more affected by cultural and environmental factors that may work against them [*1,9*].

Multivariate analysis revealed that male sex was a significant predictor of a negative treatment outcome after adjusting for confounders. The only social factor that determined a negative TB treatment outcome was illiteracy. Other determinants included adherence to sputum examination and adherence to treatment, either in the initial phase or the continuation phase.

This study has identified barriers related to the utilization patterns of TB health services in Syria in the context of culture and sensitivity to gender issues. Fortunately, those barriers did not correlate with TB treatment outcomes, as women in fact had higher success rates. We can argue that stigma, lack of knowledge and perception

Table 7 **Relative risk and attributable fraction for determinants of a negative treatment outcome among tuberculosis patients**

Variable	Risk (%)	Crude RR	95% CI	Attribut-able fraction (%)	95% CI[a]
Age (years)					
< 20	12.2	1			
20–29	9.2	0.75	0.4 to 1.6	24.6[a]	−57.3 to 63.9
30–39	13.1	1.10	0.5 to 2.5	7.1[a]	−111.6 to 59.2
40+	20.2	1.70	0.8 to 3.4	39.7[a]	−22.1 to 70.2
Sex					
Female	9.9	1			
Male	14.4	1.45	0.9 to 2.4	31.0[a]	−16.1 to 59.0
Education					
Literate	10.1	1			
Illiterate	24.0	2.40	1.5 to 3.7	58.1	34.4 to 73.2
Delay in seeking care (days)					
≤ 30	9.7	1			
31–90	12.9	1.34	0.7 to 2.5	25.2	−40.1 to 60.1
> 90	23.0	2.40	1.4 to 4.1	58.0	28.1 to 75.5
Compliant with sputum examination					
Yes	2.6	1			
No	33.5	12.70	6.5 to 25.0	92.1	84.5 to 96.0
Compliant with treatment, initial phase					
Yes	8.5	1			
No	34.2	4.00	2.6 to 6.2	75.1	61.6 to 83.9
Compliant with treatment, continuation phase					
Yes	2.3	1			
No	31.8	13.9	6.7 to 28.6	92.8	85.1 to 96.5

[a]*The attributable fraction does not implicate the 'prevented fraction' in the context of age and sex.*

of the gender role in connection with care-seeking behaviour did not adversely affect women's care-seeking behaviour, presumably due to the seriousness of TB and due to education activities about the curability of the disease.

Using a quantitative approach for data collection on gender issues in this study may well limit the results. An in-depth qualitative approach might have shown more interesting results. Another limitation of

Table 8 **Multivariate analysis of determinants of a negative treatment outcome among study subjects**

Determinant	Adjusted RR	95% CI
Age	0.99	0.96 to 1.0
Sex		
Female[a]	1	
Male	2.9	1.1 to 7.7
Education		
Literate[a]	1	
Illiterate	4.1	1.6 to 10.9
Delay in seeking care (days)		
≤ 30[a]	1	
31–90	1.7	0.6 to 4.8
> 90	2.4	0.9 to 6.7
Compliant with sputum examination		
Yes[a]	1	
No	9.8	3.9 to 24.8
Compliant with treatment, initial phase		
Yes[a]	1	
No	2.6	1.1 to 6.1
Compliant with treatment, continuation phase		
Yes[a]	1	
No	10.8	4.1 to 29.0

[a]Reference group.

this study is that the interviewers were health personnel working at the TB centres. This may have led to reporting bias for factors such as satisfaction with care.

Finally, since our results revealed gender differences in TB health care seeking behaviour and treatment outcome, this implies that sensitive interventions should rectify any imbalances or inequalities in connection with TB diagnosis, compliance and treatment. Those interventions need to be designed according to local settings. A gender approach to the TB policy and control programme may lead to improvement in the effectiveness of the Syrian National TB Programme. Further research on gender issues and TB, using qualitative approaches, may be important. The protective role of good implementation of TB treatment guidelines in the National Programme need to be stressed in the light of the study results.

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