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Marital Status in Moroccan Long-term Childhood Cancer Survivors

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Abstract: In developed countries, currently, more than 80% of children with cancer survive and they are considered as cured. However, the survivors are at high risk of medical and social late effects. In Morocco, childhood cancer accounts for 3% of all cancers. The purpose of this study was to look for factors related to marital status in Moroccan childhood cancer survivors. This was a cross-sectional study conducted among childhood cancer survivors treated between 1978 and 2004 at the Pediatric Oncology Unit of Children's Hospital of Rabat. Medical and demographic data were collected through questionnaires completed by phone or internet, by the survivor, his parent or his physician. Among 995 patients considered cured; only 195 were found. The decline from the initial diagnosis varies from 10 years to 36 years, with a mean of 16.2 years and a standard deviation of 6.3 years. In our study, we found that 31 survivors (22.3%) of adult participants were married. They were aged between 23 and 43 (the mean was 31.8 and the SD was 5.9). Men, aged more than 35 years old and unemployed are less likely to be married. To our knowledge, there is no previous study about the fate of Moroccan childhood cancer survivors before our study. Hence, it was a cross-sectional study to have a quick picture on the situation in Morocco. It would be necessary to establish a follow-up strategy in Morocco.

Key words: Childhood, cancer, survivors, marriage, Morocco.

1. Introduction

Children's malignant tumors are major causes of death in children under 15 years old in the West [1]. According to data from literature, childhood cancers are dominated by leukemia, tumors of the central nervous system (CNS) tumors of the bone and soft tissue [2]. Young people cured of childhood cancer may develop complications related to the disease itself or the treatment. With advances in cancer treatment, today more than 80 percent of children diagnosed with cancer in developed countries are alive at least five years after diagnosis. Many ultimately will be considered cured [2]. However the survivors are at high risk of medical and social late effects. Complications can be somatic, psychological or socio-occupational. In 2007, Frobisher et al. reported reduced marriage frequencies in 9,954 British childhood cancer survivors diagnosed from 1940 to 1991 compared to those expected from the general population and concluded that survivors were less likely to get married [3]. The British Childhood Cancer Survivor Study (BCCSS) which the database included 18.119 individuals, who were diagnosed with childhood cancer between 1940 and 1991, found that 66% of the 9.954 who were aged at least 16 years and eligible to receive a postal questionnaire had never been married. The category with the lowest probability of marriage were patients with CNS tumors, cranial radiation, impaired processing efficiency, and short stature. There is no difference in divorce patterns between survivors and their peers [4].

The objective of the study was to establish a long term follow up of survivors and identify medical and social disorders. The aim of this present survey was to describe marital status in childhood cancer survivors

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treated at pediatric oncology unit of the University Children Hospital of Rabat between 1978 and 2004 in order to evaluate social status.

2. Materials and Methods

2.1 Type of Study

This was a full coverage descriptive cross-sectional study.

2.2 Study Population

The study population consists of young people cured from childhood cancer (0 to 15 years) treated in Pediatric Oncology Unit of the Children Hospital of Rabat between 1978 and 2004. These young people were CR1 (complete remission without relapse) CR2 (complete remission after a single relapse) and CR3 (complete remission after 2 relapses).

This study has been presented to the local ethics committee of University Hospital Hassan II of Fez who agreed it. Informed consent has been sent to every potential participant. Questionnaires, upon receipt, have been assigned a unique number and at any time during the analysis of the study no person had been cited. These points were clearly stated in the informed consent so that the survivor of childhood cancer was not reluctant to give confidential information.

2.3 Data Collection

Initial and current medical and demographic data were collected through questionnaires completed by phone or internet by the survivor himself, his parent or his physician. Each subject enrolled in the study was contacted by phone or internet in order to present the purpose of the investigation and explain the necessity of participation of each subject. The revival was made for subjects who did not respond by telephone using social networks (facebook ...).

2.4 Statistical Analysis

All variables were summarized by using descriptive statistics. Categorical variables were described in terms of proportions and quantitative variables were described in terms of average extreme values and standard deviation.

The association between dependent variable (marital status) and several potential explanatory variables was investigated. Bi-variate analysis was used and the association between two categorical variables (for example marital status and sex) was searched by chi-square test, and was selected as the significance level a P value of 0.05.

Statistical analysis was done on SPSS Version 17.

3. Results

Among 995 patients considered cured by their last news, only 195 were found. Five (5) deaths from second malignancy or late relapse were included in our database.

3.1 Descriptive Data

The decline from the initial diagnosis varies from 10 years to 36 years, with a mean (an average) of 16.2 years and a standard deviation of 6.3 years. The male was dominant with Sex Ratio of 1.7. The range of ages of children varies from 1 month to 16 years, with a mean of 6.2 years and a standard deviation of 3.9 years. Ages 0-9 years are the most represented, totaling 77.8%. More than 50% of the survivors completing questionnaires were diagnosed and treated during the period from 2000 to 2004 and 75% from 1995 to 2004. The majority of our study population lived in urban areas (77%).

The majority of the survivors had ALL (26.4%), NHL (23.6%), HD (14.8%) and nephroblastoma (14.8%). Almost all of the patients received chemotherapy, one third was operated on and one third irradiated. The vast majority of survivors never relapsed.

The majority of the participants were aged more than 18 years old (71.6%) and 31were married (16.1% of adults). They were aged between 23 and 43 (the mean was 31.8 and the SD is 5.9). 19 (61.3%) were

employed and 9 (37.5%) made sports (at least 3 hours per week).

3.2 Correlations Marriage/Other variables

The married survivors are more likely to be females ($P = 0.048$), to be less than 35 years old ($P < 0.001$), to be employed ($P = 0.002$) and to practice less than 3 hours sport per week ($P = 0.042$). The single survivors are more likely to live with their parents ($P < 0.001$). We didn't find relation statistically significant between marital status and education level ($P = 0.143$). No correlations have been found with the type of treatment received or the evolution of the disease (Table 2).

The married survivors have less physical problems than the not married (20.7% VS 39.6%, $P = 0.045$). We didn't find relation statically significant between marital status and aesthetic problems, cognitive problems, addiction or second cancer. We found a p value close to significance between marital status and psychical problems (0.077) (Table 3).

With the question of health subjective evaluation, we didn't find a difference between married and not married survivors ($P = 0.269$) (Table 4).

Table 1 Descriptive data among 195 Moroccan childhood cancer survivors treated between 1978 and 2004.

	Frequency	Percentage (%)
Sex (n = 190)		
Female	69	36.3
Male	121	63.7
Adult (≥ 18 years old) (n = 194)		
Yes	139	71.6
No	55	28.4
Marital status (n = 139)		
Ever Married	31	22.3
Not married	108	77.7
Age at diagnosis in years (n = 189)		
00-04	81	42.9
05-09	66	34.9
10-15	39	20.6
15-19	3	1.6
Years of diagnosis (n = 185)		
1978-1984	7	3.8
1984-1989	19	10.3
1990-1994	20	10.8
1995-1999	33	17.8
2000-2004	106	57.3
Origin at diagnosis (n = 183)		
Urban	142	77.6
Rural	41	22.4
Cancers types		
Treatment		
Chemotherapy	186	98.4
Radiotherapy	64	34.8
Surgery	70	37.4
Evolution		
CRR	148	93.0
CR2	9	5.7
CR3	2	1.3

Table 2 Comparison of marital status with t socio-demographic data among 195 Moroccan childhood cancer survivors treated between 1978 and 2004.

	Married	Not Married	*P* value
Sex (n = 137)			
Female	16 (51.6%)	35 (33.0%)	**0.048**
Male	15 (48.4%)	71 (67.0%)	
Current age (n = 136)			
18-24	6 (20.0%)	70 (66.0%)	
25-29	6 (20.0%)	23 (21.7%)	
30-34	9 (30.0%)	8 (7.5%)	**< 0.001**
35-39	5 (16.7%)	4 (3.8%)	
40-44	4 (13.3%)	1 (0.9%)	
Education (n = 123)			
Not Educated	1 (3.3%)	0 (0.0%)	
Primary School	4 (13.3%)	8 (8.6%)	
Middle School	7 (23.3%)	15 (16.1%)	**0.143**
High School	3 (10.0%)	24 (25.8%)	
College/University	15 (50.0%)	46 (49.5%)	
Habitat type (n = 130)			
With Parents	5 (16.7%)	84 (84.0%)	
Alone	0 (0.0%)	15 (15.0%)	**< 0.001**
With partner	25 (83.3%)	1 (1.0%)	
Working Status			
(n = 130)			
Employed	19 (61.3%)	30 (30.3%)	**0.002**
Unemployed	8 (25.8%)	25 (25.3%)	
Student	4 (12.9%)	44 (44.4%)	
Makes Sport (at least 3 hours per week) (n = 109)			
Yes	9 (37.5%)	51 (60.0%)	**0.042**
No	15 (62.5%)	34 (40.0%)	

Table 3 Comparison of marital status with current medical data among 195 Moroccan childhood cancer survivors treated between 1978 and 2004.

	Married	Not Married	*P* value
Physical Problems (n = 135)			
Yes	6 (20.7%)	42 (39.6%)	**0.045**
No	23 (79.3%)	64 (60.4%)	
Aesthetic Problems (n = 125)			
Yes	2 (7.4%)	17 (17.3%)	**0.166**
No	25 (92.6%)	81 (82.7%)	
Psychical Problems (n = 135)			
Yes	3 (10.3%)	26 (24.5%)	**0.077**
No	26 (89.7%)	80 (75.5%)	
Cognitive Problems (n = 61)			
Yes	1 (7.1%)	6 (12.8%)	**0.489**
No	13 (92.9%)	41 (87.2%)	
Addiction (n = 134)			
Yes	2 (6.9%)	9 (8.6%)	**0.561**
No	27 (93.1%)	96 (91.4%)	
Second Cancer (n = 135)			
Yes	2 (6.5%)	1 (1.0%)	**0.132**
No	29 (93.5%)	103 (99.0%)	

Table 4 Comparison of marital status with subjective health evaluation among 195 Moroccan childhood cancer survivors treated between 1978 and 2004 (n = 162).

	Married	Not Married	*P* value
Very good	12 (50.0%)	52 (37.7%)	
Good	9 (37.5%)	38 (27.5%)	
Average	3 (12.5%)	35 (25.4%)	0.269
Bad	0 (0.0%)	10 (7.2%)	
Very bad	0 (0.0%)	3 (2.2%)	

4. Discussion

To our knowledge, there is no previous study about the fate of Moroccan childhood cancer survivors before our study. In Morocco, treatment of childhood cancer is dominated by curative treatment. Hence, it was a cross-sectional study to have a quick picture on the situation in Morocco. The study had to be exhaustive, but only 195 among 995 were found. The survivors were diagnosed between 1978 and 2004 and the survey was made on 2014, which it means that we have decline from 34 to 10 years. Consequently, many of them have changed their coordinates. Furthermore, the questionnaire was elaborated to fill by the patients themselves, but for these who are absent, the filling was often made from medical records or their parents statements. However, retrieved data are interesting, and require reflection on many levels.

Saw Arab-Muslim context we only search legal married status, actually it can be considered as abasement to ask someone in Moroccan society about partner outside marriage. In our study "ever married" included only legally couple married or engaged.

Childhood Cancer Survivor Study found that adult female survivors of childhood cancer reported lower sexual functioning, lower sexual interest, lower sexual desire, lower sexual satisfaction and lower sexual activity compared with siblings [4]. By respect to Moroccan culture, we didn't have any question about sexuality.

Many studies had considered marriage as one of important indicators of psychological adjustment and success in social life [5-7]. Marriage can be considered as a positive outcome for the majority of young people in modern societies [8]. In our study we found that 83.9% of adult survivors (more than 18 years old) had never been married. British Childhood Cancer Survivor Study, which is a population-based cohort of 18,119 individuals who were diagnosed with childhood cancer between 1940 and 1991 and survived at least 5 years, found that 56% had never been married or lived as married [9]. The North American Childhood Cancer Survivor Study conducted among 25 oncology centers in USA and Canada and including self-reported data from 10.425 survivors who survived at least 5 years from diagnosis found that 62% having never been married [10].

In our study, we found 31 (22.3%) married survivors among 136 adult participants (more than 18 years old) [11, 12]. The identification of Moroccan population 2014 found that 57.3% men aged more than 15 years old and 57.8% women aged more than 15 years old are married [13]. Marriage can be considered as desirable outcome as most Moroccan adults aver 30 years old are married [13].

In our study, we found that men, aged more than 35 years old and unemployed are less likely to be married. In Moroccan context, having an income for a man is often important to be able to marry, because typically this is the man who must ensure the financial needs of the family. In this article we have not touched on fertility as we have little data among married survivors, but some male survivors reported psychological and social suffering related to their inability to have children, especially whom treated for Hodgkin Disease with more than 4 cures of MOPP.

Married survivors are less likely to practice sport, which can be explicated by the lack of sport culture in couple or family for many Moroccan people.

In our study we didn't find that marital status among

survivors influence subjective health evaluation (P = 0.269). But there is a tendency, none of married survivors has bad or very bad estimate of his/her health, but some of not married survivors consider their health as the same. Maybe if we increase the power of the study with more participant subjects, we can find a difference statistically significant.

5. Conclusions

The childhood cancer survivors are increasing in developed countries, but also in developing countries. However they stay at risk of late medical and demographic issues. Marriage is one of important indicators of social and psychological good health. The high rate of non-marriage found in our study shows that our survivors suffer from medical and social issues. It would be necessary to establish a long term follow-up strategy to improve the outcome of childhood cancer survivor in Morocco. This follow-up should provide medical care also psychosocial and educational support for patients and their families.

Author Contribution NADIA BENAICHA: Writing the protocol, drafting the questionnaire, writing the Consent Form, conducting the survey, Statistical Analysis, Writing the article FOUZIA MSEFER ALAOUI: Conception and writing the survey project, drafting and reviewing the questionnaires, reviewing the protocol, conducting and supervising the survey, reviewing the article KARIMA ELRHAZI: Reviewing the article OUSMANE SY: Statistical analysis OUSMANE DESIRE DIAKITE: Statistical analysis CHAKIB NEJJARI: Reviewing the protocol, reviewing the questionnaire, reviewing the Consent Form, reviewing the article.

Competing Interests

The authors declare that they have no competing interests.

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