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(Article begins on next page)

1 **Myths about nutrition in pregnancy**

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7 **Short running title:** nutrition myths in pregnancy

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27 **Summary**

28 Many women have incorrect knowledge about nutrition in pregnancy owing to false beliefs derived
29 from popular practices. More than 90% of our cohort of pregnant women during early pregnancy
30 (<12 weeks of gestational age) gave at least one incorrect answer to the five questions relative to
31 common myths about nutrition in pregnancy. Education was inversely associated with the
32 percentage of incorrect answers, and the lowest percentage of any mistakes was found in the small
33 number of women who received nutritional information by a dietician.
34 In conclusion, the usual sources of information about nutrition in pregnancy are not adequate to
35 overcome the false beliefs acquired by traditions.

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53 **Introduction**

54 Nutrition during pregnancy may influence the outcomes both of mother and foetus (Berti et al.,
55 2010; Ricci E et al., 2010). Diet among pregnant women may be influenced by food preferences,
56 ethnicity, age, education, income, parity, socio-cultural influences, household and community
57 environment (Vieira Martins & Almeida Remoaldo, 2007; Aubel, 2012). Many women hold wrong
58 concepts about nutrition in pregnancy deriving from either false beliefs transmitted by parents or
59 myths belonging to the popular tradition; despite this, few data relative to confined areas are
60 available about this topic (Vieira Martins & Almeida Remoaldo, 2007).

61

62 **Methods**

63 To investigate the prevalence and the characteristics of pregnant women believing in myths about
64 diet in pregnancy, we interviewed all pregnant women consecutively admitted to the first trimester
65 obstetric echography at the Ultrasound Unit of the Obstetrical Department of the S. Anna Hospital
66 of Turin between January and July 2012. The procedures were in accordance to the Helsinki
67 Declaration principles and the study protocol had been approved by the hospital committee.
68 A semi-quantitative food-frequency questionnaire was administered to all women and data about
69 age, parity, smoking habits, exercise and the source of information about diet in pregnancy were
70 collected. Furthermore, four questions (which were all incorrect) and a fifth trap question (which
71 was indeed correct) were added to the questionnaire as indicated below:

72 1)“Do you think that a glass of red wine should be advisable to improve blood circulation during
73 pregnancy?”; 2)“Do you think that doubling food portions is necessary during pregnancy to satisfy
74 energy requirements and ensure a healthy foetal growth?”; 3)“Do you consider appropriate
75 assuming a sugar supplement (juices, candies..) in case of weakness or dizziness?”; 4)“Do you
76 believe that herbal tea may be useful to avoid fluid retention?” and 5)“Do you think that consuming
77 a medium sized portion of protein-rich foods (e.g. meat, fish, eggs, legumes..) twice a day is
78 appropriate during the course of pregnancy?”.

79 The association between incorrect answers and the other variables of interest was evaluated by a
80 logistic regression model; $p < 0.05$ was considered statistically significant.

81

82 **Results**

83 Out of 526 women evaluated at our Hospital, 421 (80.0%) accepted to participate (age 32.8 ± 4.9
84 years; gestational age 11.2 ± 0.6 weeks); 171/421 (40.62%) had graduated, 177/421 (42.04%) and
85 73/421 (17.34%) had attended secondary and primary schools respectively. Most of them (65.8%)
86 reported sedentary habits (< 2 h/week exercise), 12.3% were actual smoker and 8.8% regularly
87 consumed a moderate amount of alcohol (15g/day).

88 Information about diet in pregnancy were obtained from multiple sources in 88.8% of cases, but
89 11.2% of women did not have any source of information. The former have provided multiple
90 answers to this question: 23.8% from parents/friends, 35.9% from TV/internet/newspapers, 69.4%
91 from gynaecologist and 5.5% from dietician.

92 Table I shows the prevalence of incorrect answers to the five questions: only 7.4% of the cohort
93 correctly answered all questions. A significant inverse association between the graduation title and
94 the percentage of incorrect answers was evident, even if the underestimation of protein
95 requirements in pregnancy was common to all the education levels. The results did not change
96 significantly after adjusting for age, although women in the lowest tertile of age ($\text{age} \leq 30$ years)
97 showed a 2-fold higher risk of believing that doubling portions is correct during pregnancy
98 ($\text{OR} = 2.29$; 95% CI 1.16-4.55, $p = 0.02$).

99 Finally, only obtaining information from dieticians was associated with a correct answer to the fifth
100 question ($\text{OR} = 3.42$; 95% CI 1.41-8.28; $p = 0.007$) independently of the educational level.

101 No significant association between parity, gestational age, alcohol intake, smoking habits, exercise
102 level and incorrect answers was highlighted.

103

104 **Discussion**

105 An unexpectedly high percentage of women (>90%) reported at least one false belief about
106 nutrition in pregnancy. Education was inversely associated with the percentage of incorrect
107 answers; moreover the lowest percentage of mistakes (<60%) was found in the small number
108 (23/421) of women informed by dietitians. These results suggest that the usual sources of
109 information about nutrition in pregnancy (gynaecologists included) are not adequate to overcome
110 the false beliefs transmitted by popular practices and traditions.

111
112 We collected data from women during their first trimester of pregnancy and from a single
113 obstetrical unit. Nevertheless, this unit is the biggest gynaecological centre in Turin and we cannot
114 exclude that knowledge about nutrition could improve during the pregnancy. But it is a matter of
115 fact that a healthy diet during the first months is critical to improve both maternal and foetal
116 outcomes (Ramakrishnan et al., 2012).

117
118 These data, if confirmed by further studies, outline the need of appropriate nutritional education
119 during early pregnancy, owing to their potential implications for the mothers as for the offspring.

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122 **Declaration of Interest**

123 The authors declare that they have no conflicts of interest.

124

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126 None

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130 **References**

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156 **Table I. Percentage of incorrect answers about nutrition in pregnancy by level of education.**

		Incorrect answers			
Questions	%		OR ^a	95% CI	P
1) Do you think that a glass of red wine should be advisable to improve blood circulation during pregnancy?					
	All	21.4			
	Primary school	27.4	1		
	Secondary school	26.6	0.96	0.52-1.77	0.89
	University	13.5	0.41	0.21-0.81	0.01
2) Do you think that doubling food portions is necessary during pregnancy to satisfy energy requirements and ensure a healthy foetal growth?					
	All	5.0			
	Primary school	16.4	1		
	Secondary school	2.8	0.15	0.05-0.44	<0.001
	University	2.3	0.12	0.04-0.39	<0.001
3) Do you consider appropriate assuming a sugar supplement (juices, candies..) in case of weakness or dizziness?					
	All	71.7			
	Primary school	79.5	1		
	Secondary school	75.7	0.81	0.41-1.57	0.52
	University	64.3	0.47	0.24-0.89	0.02
4) Do you believe that herbal tea may be useful to avoid fluid retention?					
	All	34.4			
	Primary school	48.0	1		
	Secondary school	36.7	0.63	0.36-1.11	0.10
	University	26.3	0.39	0.22-0.69	0.001

5) Do you think that consuming a medium sized portion of protein-rich foods (e.g. meat, fish, eggs, legumes..) twice a day is appropriate during the course of pregnancy?

All	62.9			
Primary school	68.5	1		
Secondary school	66.1	0.90	0.50-1.61	0.72
University	57.3	0.62	0.34-1.10	0.10

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158 ^aOR evaluated by logistic regression analyses.