

Men's Knowledge About Maternal Serum Screening for Down Syndrome and their Attitude Towards Amniocentesis

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Abstract The present study aimed to assess (i) the impact of screening consultation on male partner's knowledge about second trimester maternal serum screening for Down syndrome and on their attitudes toward amniocentesis, and (ii) the concomitant effect of men's involvement in pregnancy on both knowledge and attitudes. The study included 164 men who accompanied their partners to the screening appointment. Knowledge Questionnaire and Partner's Involvement in Pregnancy Scale with two dimensions, support and distance, were administered. Involvement in pregnancy was determined using two factors; support and distance. Findings revealed a significant post-consultation improvement in men's knowledge about the test, but less-educated men and those who were more distanced from partner and pregnancy were less knowledgeable even post-consultation. Compared to before the consultation, most men had a positive attitude toward amniocentesis and were willing to suggest it to their partners in case of positive test results (77 % and 42 %, respectively). The remainder would either leave the decision to their partners (20 %) or were undecided (3 %). Higher perception of distance was associated with men's unwillingness to be involved in amniocentesis decisions, particularly before consultation. However, the consultation had considerable potential to engage men with this attitude in the decision-making process.

The study highlights the need to change woman-oriented prenatal screening practices for Down syndrome to involve their male partners in the consultation.

Keywords Maternal serum screening · Down syndrome · men's knowledge · men's involvement in pregnancy · men's attitude toward amniocentesis

Introduction

Prenatal screening tests for one of the most common autosomal aberrations, trisomy 21 (Down syndrome; DS), are widely administered throughout the world. The purpose of these tests is to identify pregnant women at high risk of having a child with DS and who would benefit from a further diagnostic investigation. In Croatia (East European, Mediterranean country), prenatal screening for chromosomal anomalies like DS has been performed in the first trimester of pregnancy using ultrasound screening and combined tests (nuchal translucency and biochemical markers), and in the second trimester (biochemical test). According to the recommendations of the Croatian Society for Perinatal Medicine (2010), all pregnant women are offered first trimester ultrasound screening performed between 11 and 14 weeks of gestation women younger than 36 years who have a negative genetic history are offered combined or biochemical screening tests. Invasive diagnostic investigations (amniocentesis, chorionic villi biopsy) are proposed to women who are 36 years old and older or who have a positive genetic history. Screening tests are optional and can be accessed in the public or private sector. Since 1996, second trimester maternal serum screening (MSS) for DS has been offered as a part of routine prenatal care in Rijeka, Croatia (Brajenović-Milić et al. 1998). Although women receive the information about the purpose and features of the test from

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their gynecologists, when the pregnancy is confirmed by ultrasound (8–10 weeks of gestation) this approach was previously found to be insufficient for informed consent (Paravić et al. 1999), so a consultation provided by specially trained staff midwives has become obligatory before testing.

Our screening practice has long been oriented to the pregnant woman as the main recipient of screening, and men's attendance has depended on their own wishes. Although many women have been accompanied by their partners, only rarely have both of them participated in the screening consultation. Men usually have remained outside the space provided for the consultation, waiting for their female partners to finish. From the beginning of 2014, our practice has been changed, and the screening consultation has been offered to both partners who attend together at screening appointments.

Research on expectant fathers' involvement in prenatal screening has grown in recent years. The vast majority of studies have been done in highly developed parts of world like the UK, Scandinavia, and USA and are mostly qualitative in design (Dheensa et al. 2013). A metasynthesis of men's experiences and involvement in prenatal screening showed that men want to be involved because they feel a responsibility to explore the health of their unborn child and to support their partners (Dheensa et al. 2013). The authors suggested that healthcare professionals need to engage men who want to be involved and who attend screening appointments by interacting with them as well as with women. Although research has shown the benefit of men's involvement in prenatal screening, little to no research has looked at practical ways to involve men without compromising women's autonomy.

Locock and Alexander (2006) showed that men who are involved in serum screening for fetal anomalies play numerous roles as parents, bystanders, protector/supporters, gatherers/guardians of fact, and deciders/enforcers. In brief, they provide their partners emotional support, advocating for them and gathering information to help with decisions. Reed (2011) also highlighted men's roles as information gatherers, as a support for their partner, and as joint decision-makers. In spite of this, Dheensa et al. (2015) reported that most men in their study did not think carefully about whether to move forward with a test or not, did not feel obligated to seek details, and rarely asked midwives questions. Although the male participants did not know much about screening tests, they did not see this as a problem and wanted professionals to take control. However, if the men had undergone bad experiences with a previous pregnancy or if some complications had arisen in the current pregnancy, male partners sought more information and became more actively involved in decision-making. Although above mentioned studies (Dheensa et al. 2015; Locock and Alexander 2006; Reed 2011) showed that men's involvement in prenatal screening was beneficial because it allowed them to support their partners and share the responsibility of decision-making with women, it is possible that

men's attendance in screening appointments per se does not mean that they would necessarily seek out more information. As Dheensa et al. (2015) found, male partners were prone to believing that the tests would confirm fetal health.

Receiving a positive result on a screening test for DS is a very stressful moment, however, and anxiety is clearly raised in women awaiting these results (Brajenović-Milić et al. 2010; Green et al. 2004; Lou et al. 2015). Male partners would probably play a significant role in support and decision-making regarding further diagnostic testing, especially when women are undecided. However, men who do not attend prenatal screening appointments are particularly unprepared for receiving and managing information about risk (Gottfredsdóttir et al. 2009; Reed 2009, 2011; Sjögren 1992), and it has been presumed that their knowledge was based mostly on what their female partner told them (Locock and Alexander 2006). How this situation allowed for negotiation between couples regarding further diagnostic testing was not explored in any of the metasynthesis studies. It would be, therefore, interesting to see what knowledge about prenatal screening tests non-attending men have; what support regarding further diagnostic testing women may receive from men if the latter are not involved in the consultation; and how these factors, knowledge and support, could be changed if men are involved in the consultation. This information would be particularly interesting for screening practices like those in Croatia where prenatal screening consultation is not routinely offered to both partners, and mainly women are informed.

Men's knowledge about various pregnancy-related issues and their willingness to participate in decisions about pregnancy in general are indicators of their own involvement in the pregnancy. Accessibility to the female partner, engagement (e.g., caring about the pregnancy, wanting to learn more about the pregnancy process), responsibility (e.g., the roles of caregiver, provider, protector), and communication with the partner have been proposed as important components that define men's involvement in pregnancy (Alio et al. 2013). Based on these, it could be expected that men who are involved in pregnancy also seek out more information about pregnancy not only from their partners but also from health care professionals, friends, the Internet, and books. In turn, they would probably be more knowledgeable and involved in the decision-making process or at least more willing to help their partners to make a decision. If so, it could be expected that male partners have some knowledge about MSS for DS and amniocentesis even before the consultation.

The present study aimed to assess (i) the impact of the screening consultation on male partner's knowledge about second trimester MSS for DS and on their attitude towards, and intention to be involved in the decision about, amniocentesis, and (ii) the relationship of men's involvement in pregnancy with knowledge, and attitude/intention towards amniocentesis decision. By exploring these areas, the study can offer

a contribution to understanding the need for changing prenatal screening practices for DS that are oriented only to pregnant women.

Methods

Participants

The study was conducted from March 1, 2014, to July 1, 2014, at the Department of Biology and Medical Genetics, Medical School, University of Rijeka, Croatia. During that time, 370 women underwent the second trimester MSS for DS mostly during the 16th week of gestation. A total of 171 women (46 %) were accompanied by their partners, and 164 of the male partners (96 %) agreed to be included in the study. A lack of time was reported as the only reason for declining participation. All participants were of the same ethnic origin (Caucasian) and were Croatian speakers. The study protocol was approved by the institutional ethics committee.

Protocols

Participants were approached by a researcher when they arrived at the Department. The aim of the study was explained, and the participants provided written informed consent. Partners were separated and placed in different rooms and completed questionnaires by themselves. Male participants completed a General Information Questionnaire, a Knowledge Questionnaire that included items about attitudes towards amniocentesis, and the Partner's Involvement in Pregnancy Scale (PIPS). Women filled out the PIPS only (women's perception of their partner's involvement during pregnancy) as a comparison to their male partner's perception of their own involvement in the pregnancy.

After that, partners were counseled together and detailed information about features of the screening and its purpose and limitations were provided by a specially trained midwife. The consultation was performed in a private room and lasted at least 10 min. Couples were encouraged to ask for further explanation. For all male participants, this was the first time that they had attended such a consultation, meaning that they had not attended a similar consultation in a previous pregnancy. All consultations were provided by the same midwife, and the following information was verbally presented: the purpose of the screening test, the clinical features of DS, the interpretation of screening results, the meaning and likelihood of positive and negative findings, the description of the amniocentesis procedure, and the amniocentesis-related risks of miscarriage. Couples were also informed about Edwards syndrome and neural tube defects, but the present study was focused on knowledge about DS only. After counseling, the male partners

were placed in a separate room and completed the Knowledge Questionnaire once again.

Measures

General Information Questionnaire Demographic data included age, education level, and work and marital status. The respondents also answered a question about the reasons for accompanying their female partner to the prenatal screening appointment.

Knowledge Questionnaire This questionnaire consisted of seven closed-type items. The questions were in line with information included in the consultation and covered knowledge about the purpose of screening, interpretation of screening results, amniocentesis procedures, and understanding the clinical features of DS. The total score was the sum of the number of items that were answered correctly, so that the maximum knowledge score was 7. This questionnaire was an expanded version of a knowledge questionnaire used in our previous research about women's knowledge and attitudes toward amniocentesis (Brajenović-Milić et al. 2008).

Men's Attitudes toward, and Intention to Be Involved in Decisions about, Amniocentesis Men's attitudes/intention to be involved in decisions about amniocentesis was assessed before receiving the test results. Participants chose from the following options: suggesting to their partner to undergo/not undergo amniocentesis, leaving their partner to make a decision, and not knowing what to do.

Partner's Involvement in Pregnancy Scale The PIPS contains 21 items that assess men's feelings and behaviors in regard to their partner's pregnancy. The scale has two parallel forms: one for women and one for men. The first measures women's perception of their partner's involvement, and the second scale measures the men's perception of their own involvement in the pregnancy (Appendix). Items are scored on a 5-point Likert scale ranging from 1 (not at all) to 5 (very much). The factor structure and reliability of the PIPS were verified in a pilot study in 210 pregnant women and their partners and additionally in our previous research on 220 women and 90 men (Brajenović-Milić et al. 2010). An exploratory factor analysis with oblimin rotation and a Cattell scree test suggested extraction of two factors (*Support* and *Distance*) in both women's and men's scales. Two factors explained 31.6 % of the variance in the PIPS scores for men and 38.3 % of the variance for women. Cronbach's alphas for the factor *Support* were 0.88 (women) and 0.83 (men), and for the factor *Distance*, they were 0.70 (women) and 0.75 (men). Two factors were independent ($r = -0.03$) (Brajenović-Milić et al. 2010).

The factor *Support* contains 15 items referencing caring about their partner and the coming child, communication with their partner, readiness to learn about pregnancy, and involvement in decision-making regarding the pregnancy. Factor scores range from 15 to 75, with higher scores indicating greater perception of support. The second factor *Distance* contains six items, which describe a feeling of distance from the partner, pregnancy, and decisions about the pregnancy. Scores range from 6 to 30, with higher scores indicating greater distance. Items that belong to the factors *Support* and *Distance* were asterisked in PIPS (Appendix). The internal consistency in the sample of the present study (164 couples) was satisfactory (*Support*: $\alpha = 0.78$ in women and $\alpha = 0.81$ in men; *Distance*: $\alpha = 0.81$ in women and $\alpha = 0.82$ in men). The correlation between the two factors in men was almost zero ($r = -0.08$), indicating independence of these two dimensions. No significant difference between women's and their partners' perceptions of support and distance during pregnancy was found ($t = 1.15, p = 0.252$; $t = -0.11, p = 0.914$, respectively). Their PIPS scores were positively correlated (support: $r = 0.25, p = 0.001$; distance: $r = 0.22, p = 0.004$).

Statistical Analyses SPSS 15.0 and Statistica 12 were used for data analysis. Differences between groups were examined using the McNemar test, and one-way analysis of variance. Paired *t*-test was used to assess change in knowledge scores. Pearson correlation was applied to examine the bivariate relationship among variables. To explore predictors of knowledge about MSS for DS, multiple regression analysis was applied. A *p* value of <0.05 was considered significant.

Results

The mean age of the surveyed men was 31.94 ± 4.5 years. Table 1 shows the men's demographic data and their reasons for accompanying their female partners to the screening appointment. The great majority had secondary education (66 %) and were employed (92 %). Offering support (41 %) and their willingness to know more about the test (19 %) were the most frequent reasons for coming with their female partners.

Impact of the Consultation on Men's Knowledge

Knowledge mean scores obtained before and after the consultation were compared to assess improvement in a male partner's knowledge about MSS for DS. Men's knowledge score measured after the consultation (6.37 ± 0.73) was significantly greater than before it (4.63 ± 2.04) ($t = -10.9$; $p < 0.001$). Table 2 summarizes the men's answers before and after the consultation to the questions related to knowledge about MSS for DS. A statistically significant difference in the total

Table 1 Men's demographic data and reasons for accompanying their partners in MSS for DS

	Number of respondents (N = 164)
Age (mean \pm SD for the group)	31.94 \pm 4.50
Education level, n (%)	
primary	7 (4)
secondary	108 (66)
2-year college	15 (9)
university	34 (21)
Work status, n (%)	
employed	151 (92)
unemployed	13 (8)
Marital status, n (%)	
married	146 (89)
not married (cohabiting)	18 (11)
Reasons for accompanying their partners, n (%)	
support	67 (41)
wanted to know more about the test	31 (19)
transport, support	17 (10)
support, wanted to know more about the test	17 (10)
transport	9 (6)
transport, support, wanted to know more about the test	8 (5)
not stated	15 (9)

knowledge score with respect to education level was identified both before and after the consultation ($F_{(3,160)} = 3.04, p = 0.03$; $F_{(3,160)} = 9.73, p < 0.001$, respectively) (Fig. 1); the more educated male partners had better knowledge before and after the consultation.

Effect of Men's Involvement in Pregnancy on their Knowledge

The mean values for men's perception of support and distance were 68.2 ± 5.6 (range 45–75) and 13.0 ± 6.1 (range 6–30), respectively. To evaluate the effect of male partner involvement during pregnancy on knowledge about MSS for DS before and after the consultation, correlations were calculated. Men's own perceptions of support did not correlate with knowledge score before or after the screening consultation ($r = 0.03, p = 0.74$; $r = -0.03, p = 0.72$, respectively). Nor did it correlate with education level ($r = 0.03, p = 0.69$). A significant negative correlation between men's own perceptions of distance and their knowledge score was found both before and after consultation ($r = -0.21, p = 0.01$; $r = -0.28, p < 0.001$, respectively). It also significantly negatively correlated with education level ($r = -0.30, p < 0.001$).

Table 2 Men's answers to survey questions before and after consultation

Questions	Number of respondents (N = 164)		p**
	Before consultation n (%)	After consultation n (%)	
1. The result of the screening test is 100 % reliable.			
Yes	20 (12)	5 (3)	<0.001
No*	119 (73)	157 (96)	
I do not know	25 (15)	2 (1)	
2. The result of the screening test is shown as a statistical risk for DS.			
Yes*	128 (78)	156 (95)	<0.001
No	8 (5)	6 (4)	
I do not know	28 (17)	2 (1)	
3. High risk for DS means that			
I am carrying a child with DS	4 (2)	5 (3)	<0.001
It is possible that I am carrying a child with DS*	144 (88)	158 (96)	
I do not know	16 (10)	1 (1)	
4. In the case of high risk for DS, amniocentesis will be offered.			
Yes*	105 (64)	161 (98)	<0.001
No	9 (5)	2 (1)	
I do not know	50 (31)	1 (1)	
5. Amniocentesis is a harmless procedure.			
Yes	29 (18)	14 (9)	<0.001
No*	80 (49)	150 (91)	
I do not know	55 (33)		
6. The result of amniocentesis is accurate.			
Yes*	70 (43)	125 (76)	0.004
No	42 (26)	38 (23)	
I do not know	52 (31)	1 (1)	
7. Which of the mentioned symptoms is always present in a DS child?			
Intellectual disability*	113 (69)	137 (84)	<0.001
One of the following: <i>heart defects, kidney defects, gastrointestinal defects, infections, leukemia</i>	13 (8)	25 (15)	
I do not know	38 (23)	2 (1)	

*correct response

**P value was calculated between frequencies of correct and incorrect responses before and after consultation (McNemar's test)

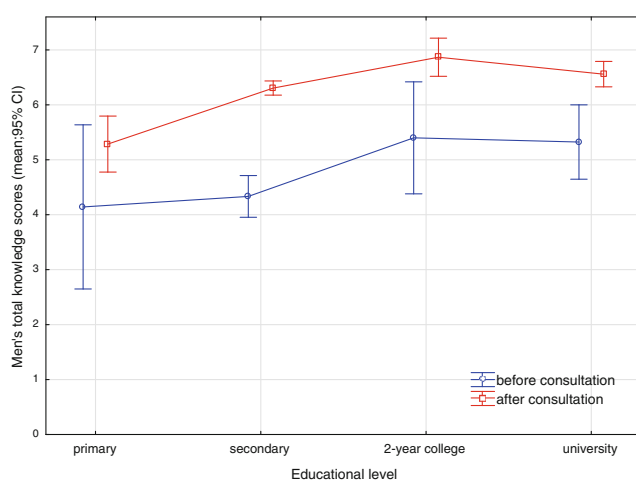


Fig. 1 Men's knowledge about MSS for DS before and after consultation in regards to their educational level

To explore the predictive effects of men's knowledge before consultation, education level and perception of distance on their knowledge after consultation, multiple regression analysis was carried out (Table 3). All entered variables explained 12.4 % of variance in total knowledge score after consultation ($R^2 = 0.12$, $p < 0.001$). However, knowledge before consultation was not a significant predictor although it was positively correlated with knowledge after consultation ($r = 0.17$, $p = 0.01$). Significant predictors were education level ($\beta = 0.19$, $p = 0.02$) and distance ($\beta = -0.20$, $p = 0.01$).

Men's Attitudes Toward, and Intention to be Involved in the Decision About, Amniocentesis

Table 4 shows men's decision intentions in regard to their knowledge and PIPS scores before and after the consultation.

Table 3 Results of hierarchical regression analysis for the men’s knowledge scores after consultation

Men’s knowledge scores after consultation			
PREDICTORS	β	ΔR^2	R^2
1. step		0.09**	0.09**
• Education level	0.19*		
• Knowledge before consultation	0.09		
2. step		0.04*	0.12**
• Perception of distance	-0.20*		

ΔR^2 : contribution of a particular group of predictors to explained variances; R^2 : overall contribution to explained variances; * $p < 0.05$, ** $p < 0.01$

After the consultation, a significant number of men changed their attitudes towards amniocentesis. Unlike before the consultation, afterward the majority of men (77 %) had a positive attitude towards amniocentesis and were willing to suggest it to their partners if a high risk for DS was determined. In addition, men’s attitudes towards amniocentesis was significantly associated with knowledge scores both before and after consultation ($F_{(3,160)} = 31.26, p < 0.001$; $F_{(2,161)} = 3.10, p = 0.04$, respectively). The degree of freedom after consultation was lower than before consultation. This was due to the reduction in number of tested groups. Before the consultation, men who did not know what to suggest to their partners about subsequent diagnostic testing had the lowest level of knowledge compared to other groups ($p < 0.001$; post-hoc test Scheffé). Although the association between men’s knowledge and attitudes was also significant after the consultation, Scheffé’s test did not show differences between any specific groups ($p > 0.05$).

A significant association between men’s perception of distance and decision intentions towards amniocentesis was observed before consultation ($F_{(3,160)} = 3.37; p = 0.02$). A Scheffé’s test showed that perception of distance was higher in the group of men who would leave the decision to their partners compared to those who would suggest amniocentesis to their partner ($p = 0.04$). No statistically significant difference in perception of distance was found after consultation ($F_{(2,161)} = 2.77; p = 0.07$).

Discussion

Using a quantitative approach, the present study contributes to existing research on male partner’s involvement in prenatal screening for DS, which has been mostly qualitative in design. The study also gives insight into the construct of men’s involvement in pregnancy in the specific context of prenatal screening tests. Our results demonstrate a significant impact of the screening consultation on male partner’s knowledge about MSS for

Table 4 Men’s attitudes towards amniocentesis as reflected in knowledge and PIPS scores

In the case of high risk for DS:	Before the consultation				After the consultation			
	No. of responses (%)	Knowledge score, mean \pm SD	Perception of support, mean \pm SD	Perception of distance, mean \pm SD	No. of responses (%)	Knowledge score, mean \pm SD	Perception of support, mean \pm SD	Perception of distance, mean \pm SD
I would suggest to my partner that she undergo amniocentesis.	68 (42)	5.63 \pm 1.23	68.18 \pm 5.97	11.39 \pm 5.57	126 (77)*	6.43 \pm 0.69*	68.37 \pm 5.78	12.64 \pm 6.09
I would suggest to my partner that she not undergo amniocentesis.	8 (5)	6.13 \pm 0.83	70.13 \pm 5.03	12.50 \pm 5.21	0 (0)*	/	/	/
I would leave my partner to make a decision.	40 (24)	4.83 \pm 1.79	68.40 \pm 5.14	14.90 \pm 6.79	33 (20)*	6.09 \pm 0.84*	67.82 \pm 5.17	15.15 \pm 6.42
I do not know what I would suggest to my partner.	48 (29)	2.79 \pm 2.03	67.81 \pm 5.74	14.02 \pm 6.16	5 (3)*	6.60 \pm 0.55*	67.00 \pm 6.04	10.20 \pm 4.15

Paired *t*-test was used to assess change in knowledge scores

* $p < 0.05$; McNemar’s test was used to assess differences between frequencies of responses before and after consultation

DS and their attitude towards subsequent diagnostic testing. However, men's perception of distance from the pregnancy affected their knowledge and attitude towards amniocentesis.

Before discussing the findings in detail, it is worth noting that men who participated in the study were noticeably involved in their partner's pregnancies; they showed a high degree of support (score ≈ 68 out of 75) and a relatively low degree of distance (score ≈ 13 out of 30). This finding supports the often mentioned assumption that men who participate in prenatal screening are likely to be engaged in the pregnancy in general (Dheensa et al. 2013). The reasons our participants gave for accompanying their female partners to the screening appointment were in line with this assumption because "support of the partner" and "wanted to know more about the test" alone or in combination were the most frequently reported reasons. Our results suggested that at the end of the consultation, even men with poor initial knowledge would become more knowledgeable as well as those who had better initial knowledge. Probably, both their willingness to gather information and the systematic explanation delivered during the consultation contributed to their knowledge improvement.

Of interest, findings showed how poor the men's knowledge before the consultation was, particularly in relation to the purpose and features of amniocentesis. Almost half of the men were either uninformed or had wrong information. It is, therefore, not hard to imagine how frustrated and confused men might be in the case of high risk for DS. At the same time, men would not be able to help women make informed decision, and this situation would probably contribute to women's feeling of anxiety and stress and additionally burden their decision regarding amniocentesis. Therefore, our results emphasize the importance of men's participation in the screening consultation, which enabled them to be well informed about the entire process of determining trisomy 21 and to be prepared for receiving a positive test result.

The present study also demonstrated a significant effect of men's involvement in pregnancy and of education level on their knowledge about MSS for DS. Namely, men who were more distanced during pregnancy were likely to be less educated and less knowledgeable even after the consultation. The association between low education and low level of male partner's involvement in pregnancy has been previously reported, as well (Martin et al. 2007). However, the specific effect of men's educational status on their knowledge regarding prenatal screening tests has not been previously explored. Dheensa et al. (2013) highlighted the need to look at this issue. Of interest, we have previously found

that women's education level predicted knowledge about MSS for DS before the consultation but not after the consultation (Brajnović-Milić et al. 2008). They received the same information during the consultation as men in the present study. Thus, the reason for the weaker knowledge demonstrated in men with less education, even after consultation, could be partly caused by their high perception of distance. On the other hand, women's willingness to gather as much information as possible during consultation could be explained by their clear sense of embodied responsibility for the health of the fetus, particularly in the case of a high risk for DS (Reed 2009). As Reed (2009) argues, men seem to take less responsibility than women.

In addition, our results pointed to a significant impact of screening consultation on men's intention to be involved in decisions regarding amniocentesis. Unlike before consultation, afterward the majority of men were prone to suggest amniocentesis to their partner in case of positive test results (42 % versus 77 %, respectively). Although these results confirm a previously reported willingness among men to be actively involved in decisions regarding amniocentesis (Dheensa et al. 2013; Dheensa et al. 2015), they also point to a considerable number of men who showed no intention of being involved (20 %). Although it was known that some men cede the decision or defer to the female partner because her body was involved (Kennan et al. 2000), the present study suggested that such an attitude could be in part influenced by their own perception of distance during pregnancy. Gathering information during the consultation might have motivated men to participate more in decisions about diagnostic testing. After the consultation, only a few men (3 %) were undecided regarding amniocentesis, but their indecisiveness was not associated with poor knowledge or high perception of distance. Because they did not declare an intention to leave the decision to their partners, it could be presumed that their decision to take action was postponed until results eventually confirmed a high risk for DS. In a future study, it would be interesting to explore how attitudes toward amniocentesis match within couples and what support women want or expect to receive from their partners regarding subsequent diagnostic testing.

The second dimension that we used for measuring involvement in pregnancy was support, which was not found to be significantly related to men's knowledge about MSS for DS or to their decision intention. Although this finding was unexpected, it could be explained by the characteristics of our participants, who were highly supportive of their partners. The range of their support score was small and shifted toward the top of the scale (range effect). So, it is possible that support

and knowledge are strongly related across the whole of their range but have no strong relationship in a limited subset of that range.

Study Limitations

One limitation of this study is that it included only those men who accompanied their female partners and who wished to participate. Furthermore, we did not control for our participants' experience with previous pregnancies that could have affected their knowledge about that specific test in the current pregnancy. However, they did not attend a similar consultation in any previous pregnancy. The knowledge questionnaire used in the study was not evaluated before the current research, but it was a modified version of a questionnaire already used in our previous research about women's knowledge and attitudes toward amniocentesis (Brajenović-Milić et al. 2008). In this study, men's knowledge was measured immediately after the consultation, so it may be useful to assess whether and how much knowledge was retained after MSS results were reported. Still, according to our practice, the test result will be received only a few days after the consultation. Finally, men's responses about what they would suggest to their partners if the fetus was screened as high risk for DS was hypothetical. In reality, a hypothetical plan might be abandoned when a positive result is received (Rapp 2000).

Practice Implications

This study highlights the need for changing prenatal screening practices for DS that are oriented only to pregnant women so that their male partners are also involved in the consultation. Men who accompany their partners are not only companions; they want to be informed. However, consultation providers, e.g., midwives, should encourage men to feel comfortable asking for additional explanations to try to buffer the negative effect of low education level, and distance on their knowledge. Practices where the decision-making process is mediated by midwives have to take care not to compromise women's autonomy because the screening consultation has the potential to engage men in decisions regarding subsequent diagnostic testing.

Conclusion

The present study demonstrated a significant impact of the screening consultation on male partner's knowledge about MSS for DS, as well as on their attitude towards amniocentesis and their willingness to participate in

decisions regarding subsequent diagnostic testing. Information gathering during consultation enabled men to understand the entire process of determining trisomy 21, including the features and purpose of amniocentesis. It was, therefore, not surprising that unlike before the consultation, afterward the majority of men had a positive attitude towards amniocentesis and showed an intention to be involved in decisions regarding amniocentesis. However, although men benefited from the consultation, their knowledge related to the test was predicted by their own involvement in the pregnancy and their education level. Men who were more distanced during pregnancy and less educated showed a lower level of knowledge even after the consultation. In addition, a high perception of distance was associated with men's unwillingness to be involved in decisions regarding amniocentesis. This finding was particularly significant before the screening consultation was provided, but information gathered during the consultation has the potential to engage men with such attitudes in the decision-making process. Regardless of involvement or not in the decision, well-informed men would be better able to cope when some complications with pregnancy arise.

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Compliance with Ethical Standards

Conflict of Interest Bojana Brajenović-Milić and Tamara Martinac Dorčić declare that they have no conflict of interest.

Human Studies and Informed Consent All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all patients before inclusion in the study.

Animal Studies No animal studies were carried out by the authors for this article.

Appendix *The following statements describe some of the possible behaviors and thoughts of future fathers. Please read each statement and assess the extent to which each of the following statements applies to you. There are no right or wrong answers.*

The numbers indicate:

1. Strongly disagree.
2. Somewhat disagree.
3. Neither disagree/neither agree.
4. Somewhat agree.
5. Strongly agree.

1. I want to know more about pregnancy and childbirth.*	1	2	3	4	5
2. I have supported my wife/partner from the beginning of the pregnancy.*	1	2	3	4	5
3. I talk to my wife/partner about her feelings about the pregnancy.*	1	2	3	4	5
4. I leave decisions regarding the pregnancy and the child to my wife/partner.**	1	2	3	4	5
5. It seems to me that I can't express my feelings about the pregnancy.**	1	2	3	4	5
6. I go with my wife/partner to her medical appointments.*	1	2	3	4	5
7. My opinion regarding the pregnancy is not acknowledged.**	1	2	3	4	5
8. I have always wanted to become a parent.*	1	2	3	4	5
9. I seek information about pregnancy in different ways (e.g., via Internet, TV shows, books, magazines).*	1	2	3	4	5
10. I am aware of the possible complications of pregnancy.*	1	2	3	4	5
11. I look forward to becoming a father.*	1	2	3	4	5
12. Since the beginning of the pregnancy of my wife/partner, I have felt like a spectator.**	1	2	3	4	5
13. I try to be as attentive as I can to my wife/partner.*	1	2	3	4	5
14. I am not familiar with the progress of the pregnancy of my wife/partner.**	1	2	3	4	5
15. I talk with my wife/partner about the problems encountered during her pregnancy.*	1	2	3	4	5
16. I try to prepare the household for the arrival of the new member.*	1	2	3	4	5
17. My wife/partner involves me in all decisions about the pregnancy.*	1	2	3	4	5
18. I am interested in and read the literature related to pregnancy.*	1	2	3	4	5
19. I do not want to attend the pregnancy course with my wife/partner.**	1	2	3	4	5
20. I help my wife/partner in everything I can to ease her pregnancy.*	1	2	3	4	5
21. I talk with my wife/partner about pregnancy.*	1	2	3	4	5

*perception of support

**perception of distance

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