

Social and Behavioural Research in Clinical Genetics

Section Editor:

Barbara Bowles Biesecker, e-mail: barbarab@mail.nih.gov

A comparison of counselee and counselor satisfaction in reproductive genetic counseling

Aalfs CM, Oort FJ, de Haes JCJM, Leschot NJ, Smets EMA. A comparison of counselee and counselor satisfaction in reproductive genetic counseling.

Clin Genet 2007: 72: 74–82. © Blackwell Munksgaard, 2007

Important insights in the process of genetic counseling can be provided by establishing levels of satisfaction. The aim of our study was to compare counselees' and counselors' satisfaction with the initial consultation in reproductive genetic counseling and to gain insight into the factors associated with their contentment. One hundred and fifty-one women and 11 counselors participated in this study. Pre-test questionnaires included counselees' socio-demographic, physical and psychological characteristics, i.e. their degree of worry, expectations, preferred participation in decision making and experienced degree of control. Post-visit questionnaires asked for counselees' and counselors' satisfaction, counselees' participation in decision making and counselees' Perceived Personal Control (PPC). Little difference was found between counselees' and counselors' overall visit-specific satisfaction (mean 79 vs 74, respectively, on a visual analogue scale from 0 to 100). The correlation between counselees' and counselors' satisfaction was medium sized ($r = 0.26$, $p < 0.01$). Counselees' satisfaction was positively associated with being pregnant and with their post-visit PPC. Counselors' satisfaction was positively associated with counselees' post-visit PPC. No other counselee and counselor related variables appeared to be associated with satisfaction, nor was the duration of the consultation. Our findings suggest that, although both groups were satisfied with the consultation, counselees and counselors do not always have equal perceptions of the consultation process and may form their evaluation in different ways. In the assessment of quality of care, evaluation of both counselees' and counselors' satisfaction deserves more attention.

**CM Aalfs^a, FJ Oort^b,
JCJM de Haes^b, NJ Leschot^a
and EMA Smets^{a,b}**

^aDepartment of Clinical Genetics, and
^bDepartment of Medical Psychology,
Academic Medical Centre, Amsterdam,
The Netherlands

Key words: genetic counseling – patient satisfaction – physician satisfaction – reproduction

Corresponding author: C. M. Aalfs,
Department of Clinical Genetics,
Academic Medical Center, Meibergdreef
15, 1105 AZ Amsterdam, The
Netherlands.

Tel.: +31 020 566 5281;
fax: +31 020 691 8626;
e-mail: c.m.aalfs@amc.uva.nl

Received 24 January 2007, revised and
accepted for publication 18 April 2007

Satisfaction with the medical encounter is an important indication of the quality of care in general (1–3). The assessment of patient satisfaction with the process of care provides the organization with insight into the size of problems, an incentive for quality improvement, leads for such improvement, and indicators for the effectiveness of quality enhancing interventions. Moreover, asking patients for their opinion may enhance the relationship. Additionally, patient

satisfaction is an important condition to be satisfied in order to reach desirable clinical outcomes such as appointment keeping or compliance with recommended treatment. Given its importance, over the past 30 years, an overwhelming number of publications on the topic have appeared. In genetic counseling, however, studies on satisfaction with the encounter are limited. Although other outcome measures of genetic counseling are also important to evaluate

the goals and quality of the genetic counseling process, counselees' satisfaction with the medical encounter is a significant and essential feature for evaluating the quality of clinical genetics services for the same reasons as for other health care interactions (4–7). Available studies on satisfaction in genetic counseling mainly involve counseling for hereditary cancer (8–12). Studies on satisfaction within the field of pre-natal screening are scarce (13, 14), and studies on satisfaction with genetic counseling for familial conditions in women with questions on reproduction mainly are lacking, to the best of our knowledge.

The physicians' perspective is also relevant in the assessment of the quality of care. Physicians' perception of health care may affect the way they treat and communicate with patients. Sufficient levels of physicians' satisfaction, e.g. may warrant their continued interaction with patients. Moreover, physicians' evaluations of the care they provide are likely to influence their willingness to actually change something in their professional performance or organization of care. Finally, satisfaction has been found to protect physicians against the physical and psychological effects of job related stress, i.e. burnout (15).

If patients and physicians differ in their evaluation of care, they may also differ in those aspects they would like to see improved. If these differences are considerable, physician-initiated improvements, based on their perception of patient needs, may not necessarily lead to a higher quality of care from the patients' perspective.

In genetic counseling, counselors and counselees may have different goals and expectations, leading to differences in the evaluation of the counseling process. Bernhardt et al. (16), e.g. found that counselor goals focus on educating and providing emotional support to counselees, whereas most counselees do not know what to expect from genetic counseling. Shankar et al. (17) showed that counselees wanted to get more information about available and developing treatments than was recognized by the counselor. In non-genetic studies on congruence of patient and physician satisfaction, patients' satisfaction rates are generally higher than physicians' satisfaction (18–22). Apparently, physicians evaluate the care they provide less positive than patients. Data about congruence of patient and doctor satisfaction are conflicting; some investigators found no congruence (21, 23, 24), while others found a moderate association (19, 22). Searching the literature, we were unable to retrieve studies examining both counselees' and counselors' satisfaction in genetic counseling.

In order to understand possible differences between patient and doctor satisfaction, it is

important to establish factors associated with this satisfaction. In the literature on patient satisfaction, three types of predictors are mostly considered. First, patient related variables are taken into account. Previous studies showed socio-demographic characteristics, physical health and psychological characteristics, like patients' worry, their expectations, their preference for participation in decision making and their PPC, to be associated with satisfaction (1, 5, 13, 22, 25–29). Second, patients' satisfaction has been shown to be physician related (30, 31). For example, patients were less satisfied when they were examined by younger physicians and by physicians who had less years of practice (30, 31). Third, an association between satisfaction and consultation characteristics, i.e. duration of the consultation and waiting time, has been found (23).

Physicians' satisfaction has been found to be positively associated with patients' higher educational level, primary language being native, better mental health, preference for receiving less than full information and organizational aspects, like waiting time (19, 22).

The purpose of the current study was, first, to compare counselors' and counselees' visit-specific satisfaction with the initial consultation in reproductive genetic counseling. Second, we wanted to explain possible differences in satisfaction by gaining insight into the factors predicting counselors' and counselees' satisfaction.

Materials and methods

Design and sample

This study was conducted at the Department of Clinical Genetics of the Academic Medical Center in Amsterdam. Consecutive women with a family history of genetic conditions, scheduled for their first appointment, were contacted by telephone by the researchers. Non-pregnant women were asked whether they had questions that explicitly concerned reproductive aspects. Subsequently, pregnant and non-pregnant women with reproductive questions were invited to participate. Counselees were eligible if they were between the ages of 16 and 43 years and able to speak, read and write Dutch. Pregnant women who were referred because of advanced maternal age only, or women who were referred by their gynecologist to discuss the implications of an adverse outcome after pre-natal diagnosis, were not included in this study.

Counselees were allocated to available counselors ($n = 11$) following routine clinical practice. All counselors were physicians; seven had

completed their training as a clinical geneticist, and four were clinical geneticist trainees.

As part of a larger study, 184 counselees completed an extensive questionnaire at the Department of Clinical Genetics, about 1 h prior to their first consultation (32). The consultations were subsequently audiotaped (33). Immediately after the encounter, both the counselees and their counselors received a short questionnaire, including questions about their degree of satisfaction with the consultation. Counselors completed the questionnaire immediately, and counselees were allowed to take the questionnaire home but were asked to complete it within a short term. If we did not receive the questionnaire within 2 weeks after the initial consultation, counselees were telephoned and encouraged to respond. Eventually, questionnaires of the counselees were received on average 20 (SD = 19) days after the initial consultation.

Measures

Pre-consultation assessment of counselees' socio-demographic characteristics such as age, marital status, level of education, ethnicity and having children were included in the pre-consultation questionnaire.

In addition, physical health aspects, like being pregnant or not, gestational age (if pregnant), genetic risk factors involved and the person affected were assessed.

The following psychological characteristics were measured in the pre-consultation questionnaire. Counselees' degree of worry was measured using one question with the numerical response scale ranging from 'not worried at all about the health of the unborn child' ($n = 0$) to 'extremely worried about the health of the unborn child' ($n = 10$). To get an indication of counselees' expectations, counselees were asked about the extent to which the referring general practitioner had discussed aspects of genetic counseling prior to the referral, using a Likert scale ranging from 'very extensively' ($n = 1$) to 'not at all' ($n = 4$). Counselees' preferred participation in decision making was measured using Sutherlands' frequently used scale, ranging from 'giving the counselor full responsibility for decision making' ($n = 1$) to 'the counselee wanting full responsibility herself' ($n = 5$) (34). Finally, counselees' experienced degree of control was measured using the Perceived Personal Control (PPC scale), consisting of nine items which represent three dimensions of control: (i) cognitive ('I think I understand what problem brought me to genetic counseling', 'I feel I know the meaning of the problem for my family's future and me', and

'I think I know what caused the problem'), (ii) decisional ('I feel I have the tools to make decisions that will influence my future', 'I feel I can make a logical evaluation of the various options available to me in order to choose one of them', and 'I feel I can make decisions that will change my family's future') and (iii) behavioral ('I feel there are certain things I can do to prevent the problem from recurring', 'I feel I know what to do to ease the situation', and 'I think I know what should be my next steps') (5). Items were rated on a three-point scale of agreement. A total score represented the sum of raw scores divided by the number of questions. The validity and reliability of the Dutch version of the questionnaire were found to be satisfactory for the total scale (35). The internal consistency (Cronbach's α) of the PPC scale in this study was 0.78.

Post-consultation assessment of counselees

The Patient Satisfaction Questionnaire (PSQ) was used to assess counselees' satisfaction with the consultation. The PSQ is a multidimensional, generic and direct measure of the process of care, seeking the counselees perspective of what occurred rather than the facts (36). It consists of five questions: (i) 'How well did the counselor address your needs?', (ii) 'How actively were you involved in talking and participating in the interaction?', (iii) 'Overall, how satisfied are you with the interaction?', (iv) 'How satisfied are you with the adequacy of the information you received from this counselor?', and (v) 'How satisfied are you with the (emotional) support you received from the counselor?' (37, 38). Answers were given on 100 mm Visual Analogue Scales (anchorpoints ranging from 0 to 100). A global satisfaction score was obtained by averaging the responses to the five questions. Internal consistency (Cronbach's α) of the PSQ in this study was 0.90.

A modified version of the scale on preferred participation in decision making was used to measure the actual participation in decision making as experienced by the counselee after the consultation. For example, the question 'The counselor and I should make decisions together on an equal basis' was modified to 'The counselor and I took decisions together on an equal basis'. The difference in pre- and post-visit participation in decision making was calculated by subtracting pre-test from post-test scores.

Counselees' perception of personal control was measured again using the PPC (Cronbach's $\alpha = 0.83$). Differences in pre- and post-visit PPC were calculated by subtracting pre-test from post-test scores.

Post-consultation assessment of counselors

Background characteristics of the counselors such as age, gender and experience (number of years in practice, including years as a resident) were included in the post-consultation questionnaire. The questions of the PSQ were adapted to make them applicable as a measure of counselors' post-visit satisfaction: (i) 'How well did you address the needs of this counselee?', (ii) 'How actively was this counselee involved in talking and participating in the interaction?', (iii) 'Overall, how satisfied are you with the interaction?', (iv) 'How satisfied are you with the adequacy of the information you gave to this counselee?', and (v) 'How satisfied are you with the (emotional) support you gave to this counselee?' (22). Answers were given on the same Visual Analogue Scales. The internal consistency (Cronbach's α) of this counselor-version of the PSQ was 0.91.

Consultation characteristics

The duration of the consultation was represented by the number of minutes on the audiotape.

Statistical analyses

For descriptive purposes, we used frequencies χ^2 and Student's *t*-tests.

For the analysis of satisfaction, we had to account for dependencies between counsees who share the same counselor. Therefore, we applied multi-level analyses, distinguishing two levels of analyses: between- and within-counselor level. Regarding counselee overall satisfaction, the amount of variance at the counselor level was not significant (ICC = 0.00, $p = 1.00$). Hence, counselee satisfaction appeared not to be dependent on the counselor visited. For counselor satisfaction, however, the amount of variance at the counselor level was significant, indicating that counselor ratings of satisfaction with their encounters with individual counsees were not independent (ICC = 0.37, $p < 0.01$). Therefore, multi-level analysis was used to analyze counselor satisfaction and single-level analysis to analyze counselee satisfaction.

Correlations (Pearson's correlation) between counselors' and counsees' satisfaction were determined at consultation level. A positive correlation at visit level indicates that if a counselor is more satisfied about a consultation, the counselee is so as well, and vice versa.

Regression analyses were used to determine predictors of counselee and counselor overall satisfaction. We chose to include only those characteristics for which an effect on patient and doctor satisfaction has been described before. Firstly, analyses were performed for each predictor variable separately, in order to be able to

represent the effects of the variables separately. Analyses were performed for the counselee and counselor separately, using multi-level analyses for the counselor. Next, multiple regression analyses were performed (with backward predictor selection), to check for possible differences with ordinary regression analysis.

The level of significance was set at 5%. Analyses were performed using SPSS for Windows 11.5.2.

Results*Participants*

Of the 184 counsees, who completed a questionnaire prior to the consultation, 151 (82%) returned the post-counseling questionnaire. Counselee characteristics are presented in Table 1.

Counsees, who did not return their post-visit questionnaire, did not differ from counsees who completed both the pre- and post-visit questionnaire in level of education, being pregnant or not, genetic risk factor involved, degree of worry, prior information received, preferred participation in decision making and duration of the consultation. However, participants were more likely to be older ($t = -2.6$, $p = 0.01$), have a partner ($\chi^2 = 11.2$, $p < 0.01$), be Dutch ($\chi^2 = 5.1$, $p = 0.02$), have children ($\chi^2 = 6.2$, $p = 0.05$), and have a higher score on the pre-visit PPC scale ($t = -2.5$, $p = 0.01$).

All 11 counselors eligible for this study participated; the three men (27%) covered 19% of all consultations. The average age of the counselors was 40 years (range 27–62). Their mean years of practice, including the years as a resident, was 9.2 (range 1–31). Counselor characteristics by visit and the duration of the visits are also presented in Table 1.

Counselee and counselor satisfaction

Counselee and counselor visit-specific satisfaction are presented in Table 2. Counselor satisfaction was consistently slightly lower than counselee satisfaction, both at item level and at overall satisfaction level. The correlation of counsees' and counselors' overall satisfaction at visit level was 0.26 ($p = 0.002$), indicating a moderate association as defined by Cohen (39).

Predictors of counselee satisfaction

Predictors of counselee and counselor satisfaction are presented in Table 3. Only two variables appeared to predict counselee satisfaction. Counsees were more likely to be satisfied with the encounter when they were pregnant and marginally

Table 1. Characteristics of counselees ($n = 151$), counselors ($n = 11$) and visits ($n = 151$)

	<i>n</i>	Percentage/ SD (range)
Counselee characteristics		
Age (years)	31	5 (18–42)
Marital status		
Married/living with a partner	135	89%
Education ^a		
Primary school/lower level high school	16	10%
Middle-level high school	81	54%
Advanced vocational/university	54	36%
Ethnicity		
Dutch	139	92%
Other	12	8%
Having children		
No	110	73%
Yes	41	27%
Gestational age (weeks)	12	5 (4–37)
Genetic risk factor		
Mental retardation	26	18%
Chromosomal abnormalities ^b	18	12%
Neurodegenerative disease ^c	18	12%
Metabolic disease ^d	20	14%
Congenital abnormalities of the nervous system ^e	11	8%
Other congenital abnormalities ^f	24	17%
Abnormal skeleton/connective tissue	9	6%
Other ^g	19	13%
Affected person		
Woman herself	24	16%
Partner	14	9%
First-degree relative	73	48%
≥Second degree relative	40	26%
Worry	6.5	2.5 (0–10)
Prior information received	3.2	0.8 (1–4)
Preferred participation in decision making process	3.8	0.9 (1–5)
Perceived personal control	2.1	0.4 (1–3)
Counselor characteristics (per visit)		
Age (years)	38	7.3 (27–62)
Gender		
Male	29	19%
Female	122	81%
Years in practice	6.7	6.1 (1–31)
Consultation characteristics		
Duration of the consultation (min)	47	12 (14–94)

^aLow: primary school, lower level of secondary school, lower vocational training. Medium: higher level of secondary school, intermediate vocational training. High: higher vocational training, university.

^bMainly down syndrome.

^cFor example, Huntington syndrome and muscular dystrophy.

^dFor example, cystic fibrosis.

^eMainly neural tube defects.

^fFor example, cleft lip/palate, microcephaly, syndromes with multiple congenital abnormalities.

^gVery diverse, e.g. abnormalities of heart, eye, ear, and urinary tract.

Table 2. Counselee ($n = 151$) and counselor ($n = 11$) satisfaction with the initial clinical genetic consultation

Satisfaction with	Counselee satisfaction Mean (SD)	Counselor satisfaction Mean (SD)	Correlation (<i>p</i> -value)
Needs addressed	80 (20)	74 (17)	0.26 (0.001)
Counselee's involvement	79 (19)	78 (15)	0.20 (0.013)
Interaction in general	80 (20)	74 (17)	0.24 (0.003)
Information given by the counselor	80 (20)	73 (17)	0.28 (0.001)
Emotional support	75 (21)	71 (17)	0.13 (0.122)
Overall satisfaction ^a	79 (17)	74 (14)	0.26 (0.002)

SD, standard deviation.

^aCounselors' and counselees' average response on the five items.

more satisfied when they perceived higher personal control after the consultation. These effects were even more clear in the multiple regression analysis (regression coefficient = 5.5, SEM = 2.88, $p = 0.06$ and regression coefficient = 6.1, SEM = 2.73, $p = 0.03$, respectively). Changes in PPC and a discrepancy between preferred and perceived participation in decision making, i.e. pre- and post-consultation, were not associated with counselee satisfaction. Counselee satisfaction could not be predicted by the other counselee variables, like age, level of education, being Dutch or not, being affected or not, degree of worry, prior information received and participation in decision making as perceived by the counselee after the consultation. Counselor variables and the duration of the consultation were also not associated with counselee satisfaction. By the set of variables that were included in the regression analysis, 5% of the variance in counselee satisfaction could be explained, which effect may be characterized as small to medium-sized as defined by Cohen (39).

The counselors' satisfaction was associated with the post-consultation PPC of the counselee. Counselor satisfaction was associated neither with a change in PPC from before to after the consultation nor with a difference between preferred and perceived participation in decision making. None of the other counselee variables was associated with counselor satisfaction, neither was the duration of the consultation. Although counselors mutually differed in mean satisfaction, counselor related variables as assessed in our study, were not associated with counselor satisfaction. The set of variables explained 7% of the variance in counselor satisfaction, indicating a small to medium-sized effect as defined by Cohen (39).

Multiple regression analyses in counselors and counselees, both forward and backward, yielded the same associations.

Table 3. Predictors of counselee and counselor satisfaction, using regression analyses for each variable separately. For counselor satisfaction, multi-level regression analyses were performed

Predictor variables	Counselee satisfaction Coefficient B ^a (SEM)	Counselor satisfaction Coefficient B (SEM)
Counselee variables		
Pregnancy	5.53** (2.74)	-2.10 (1.93)
Age	-0.33 (0.30)	-0.25 (0.21)
Education	0.34 (2.18)	1.90 (1.50)
Ethnicity (Dutch)	-4.26 (5.26)	-1.57 (0.66)
Woman or partner affected	-1.40 (3.16)	2.84 (2.19)
Worry	0.46 (0.57)	-0.21 (0.39)
Prior information received	-0.74 (1.68)	-1.40 (1.18)
Post-visit preferred participation in decision making	1.40 (1.14)	0.35 (0.79)
Post-visit perceived personal control	4.48* (2.91)	4.40** (2.08)
Counselor variables		
Age	-0.10 (0.18)	-0.23 (0.29)
Gender	0.16 (3.49)	2.30 (6.29)
Years in practice	0.17 (2.08)	-3.90 (3.43)
Visit variables		
Duration of consultation	-0.01 (0.13)	0.12 (0.09)

SEM, standard error.

^aThe regression coefficient B indicates the change in satisfaction for each unit increase in the explanatory variable.

*, $p < 0.10$; **, $p < 0.05$.

Discussion

In this study, both counselees' and counselors' reported satisfaction with the initial clinical genetic consultation was high. Because the PSQ covers the educational, decisional and affective aspects of a consultation, which are all explicit goals of genetic counseling (4, 40), our findings suggest a good quality of reproductive genetic counseling at our Center.

On the other hand, other factors may contribute to high levels of self-reported satisfaction. Counselees judged their counselor, on whom they are dependent for receiving further care, which may make them reluctant to express a negative opinion. Respondents' characteristics, such as age or educational attainment, self interest or gratitude, perceptions of physicians' duty and culpability, and confidence in the physician may all lead to high satisfaction scores (2, 29, 41, 42). Counselors' reported satisfaction may reflect satisfaction with their job in general, rather than their perception of the individual consultation. Also, counselors had to judge their own behavior and, based on social desirability considerations, they may have been more critical, explaining their consistently lower satisfaction scores. In addition, the difference between counselor and counselee satisfaction ratings, may reflect differences in the sampling time frame (1, 37). Jackson et al. (1) showed that immediately post-visit, patient satisfaction reflected aspects of patient-doctor communication, while their 2-week and 3-month satisfaction reflected more of the health outcome. Counselors in our study completed the questionnaire imme-

diately after the consultation, whereas counselees took about 3 weeks to return the questionnaire. Hence, counselees' satisfaction rates may in part reflect outcome (e.g. reassurance about the health of the unborn child), whereas counselors' satisfaction rates are more likely to reflect aspects of communication during the consultation. Yet, notwithstanding the foregoing alternative interpretations, the high satisfaction scores in our study may be an accurate reflection of counselees' positive experiences.

Providing emotional support is recognized as an important goal in genetic counseling (7, 16). Interestingly, both counselees and counselors scored lowest on this aspect of the consultation indicating their relative discontent with this aspect of counseling. Moreover, their satisfaction ratings concerning emotional support did not correlate, suggesting that they form their valuation on different grounds. These results are in line with findings in a study among BRCA1 and BRCA2 carriers, where 19% indicated that they needed more emotional support than was received (9). Our findings, however, concern the initial consultation only. In most women, further consultations take place. In addition, psychosocial nurses and psychologists are available at most departments of clinical genetics, providing support when needed. Conclusions about satisfaction with the emotional support throughout the genetic counseling process as a whole, therefore, cannot be drawn. Yet, the relative low scores on this dimension warrant further investigation into how emotional support is provided and whether there is room for improvement.

It is of note that counselees' satisfaction was independent of the counselor visited. This is in accordance with the findings of Zandbelt et al. (22), who suggest that 'patients have little reference material to judge their physicians, as patients see their physician infrequently and generally meet few different specialists. By contrast, physicians encounter many patients daily, which enable them to compare visits'. This lack of difference between counselors may also mean that they provide similar quality of care. The counselors themselves, however, differed in the evaluation of their consultations; some counselors were more positive than others. Assessment of the consultations regarding the counselors' affective tone (e.g. irritation, anxiety, dominance, interest, friendliness and distress), the degree of psychosocial interaction and the decision making process, showed no differences between counselors (33). This suggests that differences in evaluation reflect individual differences in a standard set for evaluating their consultation, rather than actual differences in the quality of counseling.

Counselees' satisfaction was associated with their perception of control following the initial consultation. The concept of PPC was first introduced in genetics by Shiloh et al. (43), as a measure for the evaluation of counseling outcomes and has since then been applied in only a few other studies (35, 44, 45). These investigations found satisfaction with counseling to be positively associated with post-counseling 'PPC' scores (35, 44). Zandbelt et al. (22) found internal medicine patients' satisfaction, as measured with the PSQ, to be associated with their sense of self-efficacy (i.e. their confidence that one can successfully take appropriate and meaningful action). Although the concept of self-efficacy originates from another theoretical background (46, 47) than PPC (48), together these findings lend robustness to the conclusion that patients appreciate physicians' contributions to offering opportunities to gain feelings of mastery over their circumstances. Contrary to our expectations, no association was found with an increase in perceptions of control from pre- to post-consultation. Unfortunately, we cannot provide an explanation for this counterintuitive result.

Interestingly, counselors' satisfaction was also associated with counselees' post-consultation perceptions of control. Genetic counselors aim to decrease uncertainty and increase feelings of control in their clients by providing information about genetic risks and test opportunities, and by helping their clients to reach a well-informed decision. Counselors may recognize when they succeed in reaching this goal (as reflected in higher

PPC scores of the counselee), leading to a sense of satisfaction on their part.

Pregnant women appeared to be more satisfied than non-pregnant women with the initial clinical genetic consultation. In most pregnant women, the process of genetic counseling has to be completed within a short period of time to enable preventive measures concerning the health of the unborn child, to enable pre-natal diagnosis and to prevent unnecessary worry. In addition, counselors may feel irritated about the late timing of referral and may in some cases feel ambivalent about the only therapeutic option, i.e. termination of the pregnancy. Therefore, we assumed both counselors and counselees to experience more time and psychological constraints if the woman was pregnant, leading to suboptimal care and consequently lower satisfaction ratings (32). Yet, we found pregnant women to be more satisfied. Their satisfaction may have been enhanced because of the prompt scheduling of the appointment, always within a week. Non-pregnant women had to wait 2 to 3 months for their first appointment, which may decrease satisfaction on forehand (19, 22). In addition, both pregnant and non-pregnant women returned the questionnaire on average 3 weeks after the initial consultation. Within these 3 weeks, the counseling process in pregnant women generally progresses more swiftly as a result of which they may have been reassured rather rapidly about the health of their unborn child. In contrast, the counseling process in non-pregnant women often takes weeks to months. Finally, pregnant women may feel more grateful after reassurance resulting from additional examinations (e.g. ultrasound investigations), while non-pregnant women receive information about a genetic risk, instead of being reassured. This difference in waiting time and reassurance at the time of assessment may have affected satisfaction ratings (1). One way or the other, our findings indicate that time constraints and other assumed disadvantages of genetic counseling during a pregnancy do not lead pregnant counselees to be more dissatisfied than non-pregnant counselees.

We expected to find satisfaction to be associated with socio-demographic-, psychosocial- and consultation characteristics. Yet, neither counselees' nor counselors' satisfaction was associated with socio-demographic or psychosocial variables. In fact, we were able to explain only a small part of the variance in counselee and counselor satisfaction. Maybe, the variance of some of these variables was too small to find an effect on satisfaction. Because the study sample was limited to women in their reproductive years, the standard deviation of the mean age, e.g. was small. In

addition, the operationalization of some of the variables differed from previous reported predictors of satisfaction. For example, unmet expectations have been shown to decrease satisfaction (1). The concept of 'unmet expectations', however, differs from our variable 'prior information received'. Although one may assume that more information about the genetic counseling process prior to referral may lead to more realistic expectations, and thus to less unmet expectations, these relationships are not clear-cut. Regarding the lack of association between satisfaction and counselor related variables, the number of counselors may have been too small to measure such an association. Finally, the lack of impact of consultation time may be explained by the relative length of these encounters, namely three quarters of an hour on average. This may be enough time to discuss all matters of relevance to counselees. Others have shown that particularly short consultations with high technical medical efficiency undermine patient satisfaction (49). It is of note, however, that our results are in line with findings from others who reported equally low correlations between satisfaction and patient or consultation characteristics [e.g. (22), (25)].

Some study limitations should be considered. As stated, the sample size was small, especially with regard to the counselors. With a larger sample, more predictors of both counselees' and counselors' satisfaction might have been identified. Secondly, women who participated in the larger study, but who did not return their post-visit questionnaire, differed in several ways from women who completed both the pre- and post-visit questionnaire. It cannot be excluded that non-participants were less satisfied, as they were younger, less often had a partner and children, less often were Dutch, and scored lower on the PPC scale. Yet, overall participation rates were high, making this an unlikely source of significant bias. Thirdly, our instrument to measure satisfaction can be criticized on the same grounds as many other instruments (36, 41). Noticeably, scores were skewed and validity remains an issue of concern, despite positive characteristics such as a clear focus on the consultation, the inclusion of multiple items probing for satisfaction with different aspects relevant for genetic counseling and good internal consistency (36). In addition, construct validity is to some extent supported by the finding in a previous study of PSQ scores being associated with physicians' consultation behaviors' (38). Finally, one-item measures were used for the assessment of counselees' degree of worry and expectations, which may have made the assessment less reliable.

In conclusion, both counselees and counselors reported that they felt satisfied with the initial clinical consultation in reproductive genetic counseling. However, considering the small to moderate association between counselees' and counselors' satisfaction and the dissimilar factors influencing their satisfaction, there may be differences between counselees and counselors in their evaluation of the consultation process. Unfortunately, our results provide little insight into what these factors might be because we found few explaining variables. Attention to and awareness of these differences in genetic counseling remains important, in order to reach a high quality of care.

Acknowledgements

We thank the counselees and counselors for their participation in the survey, and Phia Kuyten for her helpful contributions to this study.

References

1. Jackson JL, Chamberlin J, Kroenke K. Predictors of patient satisfaction. *Soc Sci Med* 2001; 52 (4): 609–620.
2. Avis M, Bond M, Arthur A. Questioning patient satisfaction: an empirical investigation in two outpatient clinics. *Soc Sci Med* 1997; 44 (1): 85–92.
3. Withrow SC. The 8 dimensions of quality. *Healthc Financ Manage* 2006; 60 (12): 86–91.
4. Shiloh S, Avdor O, Goodman RM. Satisfaction with genetic counseling: dimensions and measurement. *Am J Med Genet* 1990; 37 (4): 522–529.
5. Berkenstadt M, Shiloh S, Barkai G, Katznelson MB, Goldman B. Perceived personal control (PPC): a new concept in measuring outcome of genetic counseling. *Am J Med Genet* 1999; 82 (1): 53–59.
6. Clarke A, Parsons E, Williams A. Outcomes and process in genetic counselling. *Clin Genet* 1996; 50 (6): 462–469.
7. Wang C, Gonzalez R, Merajver SD. Assessment of genetic testing and related counseling services: current research and future directions. *Soc Sci Med* 2004; 58 (7): 1427–1442.
8. Lobb EA, Butow PN, Barratt A et al. Communication and information-giving in high-risk breast cancer consultations: influence on patient outcomes. *Br J Cancer* 2004; 90 (2): 321–327.
9. Metcalfe KA, Liede A, Hoodfar E, Scott A, Foulkes WD, Narod SA. An evaluation of needs of female BRCA1 and BRCA2 carriers undergoing genetic counselling. *J Med Genet* 2000; 37 (11): 866–874.
10. Nordin K, Liden A, Hansson M, Rosenquist R, Berglund G. Coping style, psychological distress, risk perception, and satisfaction in subjects attending genetic counselling for hereditary cancer. *BMJ* 2002; 39 (9): 689–694.
11. Lobb EA, Butow P, Barratt A, Meiser B, Tucker K. Differences in individual approaches: communication in the familial breast cancer consultation and the effect on patient outcomes. *J Genet Couns* 2005; 14 (1): 43–53.
12. Tercyak KP, DeMarco TA, Mars BD, Pashkin BN. Women's satisfaction with genetic counseling for hereditary breast-ovarian cancer: psychological aspects. *Am J Med Genet* 2004; 131A (11): 36–41.

13. Muller MA, Bleker OP, Bonsel GJ, Bilardo CM. Women's opinions on the offer and use of nuchal translucency screening for Down syndrome. *Prenat Diagn* 2006; 26 (2): 105–111.
14. Tercyak KP, Johnson SB, Roberts SF, Cruz AC. Psychological response to prenatal genetic counseling and amniocentesis. *Patient Educ Couns* 2001; 43 (1): 73–84.
15. Ramirez AJ, Graham J, Richards MA, Cull A, Gregory WM. Mental health of hospital consultants: the effects of stress and satisfaction at work. *Lancet* 1996; 347 (9003): 724–728.
16. Bernhardt BA, Biesecker BB, Mastromarino CL. Goals, benefits, and outcomes of genetic counseling: client and genetic counselor assessment. *Am J Med Genet* 2000; 94 (3): 189–197.
17. Shankar A, Chapman P, Goodship J. Genetic counselling: do we recognise and meet the consultants' agenda? *J Med Genet* 1999; 36 (7): 580–582.
18. Hendriks AA, Oort FJ, Vrieling MR, Smets EM. Reliability and validity of the Satisfaction with Hospital Care Questionnaire. *Int J Qual Health Care* 2002; 14 (6): 471–482.
19. Jung HP, Wensing M, Olesen F, Grol R. Comparison of patients' and general practitioners' evaluations of general practice care. *Qual Saf Health Care* 2002; 11 (4): 315–319.
20. Kurata JH, Nogawa AN, Phillips DM, Hoffman S, Werblun MN. Patient and provider satisfaction with medical care. *J Fam Pract* 1992; 35 (2): 176–179.
21. Rashid A, Forman W, Jagger C, Mann R. Consultations in general practice: a comparison of patients' and doctors' satisfaction. *BMJ* 1989; 299 (6713): 1015–1016.
22. Zandbelt LC, Smets EM, Oort FJ, Godfried MH, de Haes HC. Satisfaction with the outpatient encounter: a comparison of patients' and physicians' views. *J Gen Intern Med* 2004; 19 (11): 1088–1095.
23. Probst JC, Greenhouse DL, Selassie AW. Patient and physician satisfaction with an outpatient care visit. *J Fam Pract* 1997; 45 (5): 418–425.
24. Winefield HR, Murrell TG, Clifford J. Process and outcomes in general practice consultations: problems in defining high quality care. *Soc Sci Med* 1995; 41 (7): 969–975.
25. Hall JA, Dornan MC. Patient sociodemographic characteristics as predictors of satisfaction with medical care: a meta-analysis. *Soc Sci Med* 1990; 30 (7): 811–818.
26. Wertz DC, Sorenson JR, Heeren TC. "Can't get no (dis)satisfaction": professional satisfaction with professional – client encounters. *Work Occup* 1988; 15 (1): 36–54.
27. Hallowell N, Murton F, Statham H, Green JM, Richards MP. Women's need for information before attending genetic counselling for familial breast or ovarian cancer: a questionnaire, interview, and observational study. *BMJ* 1997; 314 (7076): 281–283.
28. Michie S, Marteau TM, Bobrow M. Genetic counselling: the psychological impact of meeting patients' expectations. *J Med Genet* 1997; 34 (3): 237–241.
29. Williams S, Weinman J, Dale J, Newman S. Patient expectations: what do primary care patients want from the GP and how far does meeting expectations affect patient satisfaction? *Fam Pract* 1995; 12 (2): 193–201.
30. Hall JA, Irish JT, Roter DL, Ehrlich CM, Miller LH. Satisfaction, gender, and communication in medical visits. *Med Care* 1994; 32 (12): 1216–1231.
31. Krupat E, Rosenkranz SL, Yeager CM, Barnard K, Putnam SM, Inui TS. The practice orientations of physicians and patients: the effect of doctor-patient congruence on satisfaction. *Patient Educ Couns* 2000; 39 (1): 49–59.
32. Aalfs CM, Mollema ED, Oort FJ, de Haes HCJM, Smets EMA. Genetic counseling for familial conditions during pregnancy: an analysis of patient characteristics. *Clin Genet* 2004; 66 (2): 112–121.
33. Aalfs CM, Oort FJ, de Haes HC, Leschot NJ, Smets EM. Counselor-counselee interaction in reproductive genetic counseling: does a pregnancy in the counselee make a difference? *Patient Educ Couns* 2006; 60 (1): 80–90.
34. Sutherland HJ, Llewellyn-Thomas HA, Lockwood GA, Trichter DL, Till JE. Cancer patients: their desire for information and participation in treatment decisions. *J R Soc Med* 1989; 82 (5): 260–263.
35. Smets EM, Pieterse AH, Aalfs CM, Ausems MG, van Dulmen AM. The perceived personal control (PPC) questionnaire as an outcome of genetic counseling: reliability and validity of the instrument. *Am J Med Genet* 2006; 140 (8): 843–850.
36. Hudak PL, Wright JG. The characteristics of patient satisfaction measures. *Spine* 2000; 25 (24): 3167–3177.
37. Blanchard CG, Labrecque MS, Ruckdeschel JC, Blanchard EB. Physician behaviors, patient perceptions, and patient characteristics as predictors of satisfaction of hospitalized adult cancer patients. *Cancer* 1990; 65 (1): 186–192.
38. Ong LM, Visser MR, Lammes FB, De Haes JC. Doctor-patient communication and cancer patients' quality of life and satisfaction. *Patient Educ Couns* 2000; 41 (2): 145–156.
39. Cohen J. *Statistical power analysis for the behavioral sciences*. Rev. ed. Hillsdale, NJ: Lawrence Erlbaum Associates, 1987.
40. Resta RG. Defining and redefining the scope and goals of genetic counseling. *Am J Med Genet C Semin Med Genet* 2006; 142 (4): 269–275.
41. Sitzia J. How valid and reliable are patient satisfaction data? An analysis of 195 studies. *Int J Qual Health Care* 1999; 11 (4): 319–328.
42. Williams B, Coyle J, Healy D. The meaning of patient satisfaction: an explanation of high reported levels. *Soc Sci Med* 1998; 47 (9): 1351–1359.
43. Shiloh S, Berkenstadt M, Meiran N, Bat-Miriam-Katzelson M, Goldman B. Mediating effects of perceived personal control in coping with a health threat: the case of genetic counseling. *J Appl Soc Psychol* 1997; 27 (3): 1146–1174.
44. Pieterse AH, Ausems MG, van Dulmen AM, Beemer FA, Bensing JM. Initial cancer genetic counseling consultation: change in counselees' cognitions and anxiety, and association with addressing their needs and preferences. *Am J Med Genet* 2005; 137 (1): 27–35.
45. Davey A, Rostant K, Harrop K, Goldblatt J, O'Leary P. Evaluating genetic counseling: client expectations, psychological adjustment and satisfaction with service. *J Genet Couns* 2005; 14 (3): 197–206.
46. Bandura A. *Self-efficacy; the exercise of control*. New York, NY: WH Freeman & Co, 1997.
47. Taylor SE. Adjustment to threatening events. *Am Psychol* 1983; 38 (4): 1161–1171.
48. Thompson SC, Sobolev-Shubin A, Galbraith ME, Schwakovsky L, Cruzen D. Maintaining perceptions of control in low control circumstances. *J Pers Soc Psych* 1993; 64 (10): 293–304.
49. Goedhuys J, Rethans JJ. On the relationship between the efficiency and the quality of the consultation. A validity study. *Fam Pract* 2001; 18 (6): 592–596.