Psychology in Spain, 2002, Vol. 6. No 1, 61-67

ANTICIPATORY ANXIETY IN WOMEN RECALLED FOR FURTHER MAMMOGRAM BREAST CANCER SCREENING

Bonifacio Sandín, Paloma Chorot, Rosa M. Valiente, Lourdes Lostao* and Miguel A. Santed**
**Universidad Nacional de Educación a Distancia (UNED) and **Universidad Pública de Navarra*

En esta investigación se ha estudiado la ansiedad, el estado de ánimo deprimido, la depresión y la sintomatología somática asociados a la participación en pruebas complementarias de screening de cáncer de mama. Mil ciento noventa y cinco mujeres, con edades entre 45 y 65 años, fueron entrevistadas en dos momentos temporales (pre- y post-mamografía). Las participantes eran mujeres que acudían a realizar pruebas rutinarias de screening de cáncer de mama que fueron citadas para repetir las pruebas (i.e., pruebas complementarias) y mujeres que, asistiendo a las pruebas rutinarias, no fueron citadas a pruebas complementarias. Las variables fueron evaluadas a través de una escala de emociones tipo Likert de 10 puntos, el Cuestionario Estado-Rasgo (STAI) de Spielberger, Gorsuch y Lushene, la Escala de Síntomas Somáticos de Sandín y Chorot, y el Cuestionario de Depresión de Sandín y Valiente. Los resultados indican que las mujeres asistentes a las pruebas complementarias exhibían niveles significativamente más elevados de ansiedad anticipatoria y estado de ánimo deprimido que las mujeres que únicamente participaban en las pruebas rutinarias, durante los días que precedían a la realización de la prueba de mamografía. Los datos apoyan la hipótesis de que las mujeres que son llamadas para repetir la mamografía experimentan niveles entre moderados y altos de ansiedad y ánimo deprimido antes de la prueba, pero no sostienen la predicción de que tal efecto sea duradero (i.e., persista después de obtener el resultado negativo).

This investigation examined anxiety, depressive mood, depression and somatic symptoms associated with a second-stage screening for breast cancer. Interviews were conducted with 1195 women aged 45-65 in two time conditions (pre- and post-mammogram). Participants included women attending for routine breast cancer screening who were recalled for further mammogram, and women who were not recalled. Variables were assessed using a 10-point Likert emotion scale, the State-Trait Anxiety Inventory of Spielberger, Gorsuch and Lushene, the Somatic Symptoms Scale of Sandín and Chorot, and the Depression Questionnaire of Sandín and Valiente. Results indicated that women attending the second-stage screening exhibited significantly higher levels of anticipatory anxiety and depressive mood before the mammogram than women attending for routine screening. This emotional impact was not relevant two days after the mammogram. Data support the hypothesis that women recalled for further mammograms experience moderate to high levels of anxiety and depressive mood before the mammogram, though they do not sustain the prediction that this effect persists beyond receipt of the negative result.

Breast cancer is one of the commonest forms of cancer in women, and one of the major causes of death among them (Ascunce, 1991; Lostao, 1994). Nevertheless, it has been suggested that the death rate from breast cancer can be significantly reduced if the disease is detected early by means of mammogram screening programmes (Chamberlain & Palli, 1993). Increased acceptance of and participation in routine breast cancer detection screening (Ascunce & Del Moral, 1993; Gad & Rosselli del Turco, 1993; Rakowski, Stoddard, Rimer, Fox, Andersen, Urban, Lane, & Costanza, 1997) has led to an increase in the number of women that are recalled to repeat the mammogram (i.e., for a complementary check) due to some type of abnormality in the results of routine screening (suspicion of cancer risk, inconclusive data, problems of interpretation, etc.). The proportion of mammograms with abnormal or unsatisfactory results has been estimated at between 10% and 20% (Wardle & Pope, 1992), which means that the number of women affected by this type of problem is high.

Although only a small proportion of women who are required to have further tests turn out to have cancer, the fact of being recalled for a second screening may generate exceptional levels of psychological impact since, as some authors have pointed out (Skrabaneck, 1985), repetition of the mammogram represents a "false positive" (i.e., the woman temporarily experiences the diagnosis of cancer). Indeed, as Marteau (1994) has suggested, uncertainty about the result tends to be more worrying than actually receiving a negative or positive result.

The original Spanish version of this paper has been previously published in *Psicothema*, 2001, Vol. 13. No 2, 240-246

.....

Correspondence concerning this article should be addressed to Bonifacio Sandín, Facultad de Psicología, Universidad Nacional de Educación a Distancia (UNED), 28040 Madrid (Spain).
E-mail: bsandin@psi.uned.es

Thus, given the high number of women whose results are inconclusive after the first mammogram, involvement in complementary tests may constitute in itself a considerable public health problem (in the USA, for example, over 4 million women a year are required to repeat the tests; Lerman, Trock, Rimer, Jepson, Brody & Boyce, 1991).

Despite the supposed relevance of studying the way women involved in such tests may be psychologically affected, few studies have dealt specifically with this issue, and the information available is scarcely conclusive. Ellman, Angelin, Christians, Moss, Chamberlain and Maguire (1989) found no significant differences in psychiatric morbidity between a group of women that attended routine screening and a group attending a second-stage screening, even though they did observe the latter to present higher levels of anxiety during the period just before the test. In any case, these differences in anxiety disappeared after three months of follow-up. Likewise, in a recent study, Clutton, Pakenham and Buckley (1999) found that women who, participating in a routine breast cancer screening programme, were required to repeat the mammogram, did not present significant levels of anxiety and psychopathology six weeks after the repetition.

Other studies, however, have found that women recalled for further tests suffered high psychological impact – and that this impact was greater than that experienced by women undergoing only the routine screening. This phenomenon has been observed both in the short term (i.e., during the few days just before the test; Cockburn, Staples, Hurley, De Luise, 1994) and in the longer term (three months after the second mammogram; Lerman et al., 1991). The latter group of authors concluded that the psychological effect (anxiety) and perception of risk persisted, despite the fact that the women had been adequately informed that they did not have cancer.

Apart from the fact that empirical evidence on the psychological effects associated with second-stage screening is scarce and inconclusive, the studies that have approached this phenomenon up to now have had some weaknesses, such as using fairly unrepresentative samples (sample size is generally less than 100, and/or women attending routine tests are not always used as control group) and retrospective or transversal methods. It would appear necessary, therefore, to carry out further research aimed specifically at examining the possible adverse psychological effects (i.e., the "psychological costs") associated with participation in complementary breast cancer screening.

The aim of the present work was to study the anticipatory anxiety associated with complementary tests in women participating in the Breast Cancer Detection Programme (*Programa de Detección de Cáncer de Mama*, PDCM) run by the Government of Navarra in north-eastern Spain (Ascunce & Del Moral, 1993). According to our main hypothesis, women recalled for a second mammogram should experience higher levels of anticipatory anxiety and display other negative emotional features (depressive mood, depression and somatic symptoms) before the test than women attending a routine screening. In a second hypothesis we postulated that the effects associated with the second screening would not persist beyond receipt of a negative result. To test these hypotheses we used a large sample of women that attended the PDCM and a pre-post design.

METHOD

Design

Psychological assessments were carried out in two time conditions. (1) *Pre-mammography*: data were obtained immediately prior to the mammogram; (2) *Post-mammography*: data were obtained two days after the mammogram. Women were divided into two groups, a second-stage screening group (SSS group) and a routine screening group (RS group). Only the SSS group provided data in Time Condition 2.

Participants

We used a total sample of 1,200 women that had mammograms as part of the PDCM of Navarra. Two groups were formed: (a) one group of 600 women who were called back to repeat the screening, due to the fact that their routine mammogram had been inconclusive or shown some sign of abnormality [*second-stage screening group (SSS)*], and (b) a control group of 600 women who, having participated in the routine screening, were not recalled to repeat it [*routine screening group (RS)*]. The 600 subjects in the RS group were selected at random from a sample of 1,600 women that had just had routine breast cancer screening. Of the 1,200 women definitively selected (both groups), five were diagnosed with breast cancer and excluded from the study. The women's age ranged from 45 to 65 years, and corresponded to the age range included in the PDCM. There were no differences between the two groups in age, educational level or marital status. Seventy-six percent of the women were aged 45 to 55, 59% had only elementary education and 76.5% were married.

Measures

Sociodemographic variables. Sociodemographic variables included age, educational level and marital status. They were assessed during the first interview by means of an individual interview sheet.

Self-rating variables. Self-rating was used to assess anticipatory anxiety ("To what extent have you felt anxious or nervous?") and depressive mood ("To what extent have you felt sad or depressed?") for the two days prior to the test, by means of an analog scale with points labelled from "None/absent" (1) to "A lot/Extremely severe" (10). This measure test is equivalent to that used by Lerman et al. (1991).

State-Trait Anxiety Inventory (STAI). We used the Spanish version adapted by Técnicos Especialistas Asociados (TEA; Spielberger, Gorsuch & Lushene, 1982), applying Part 1, which specifically assesses the state of anxiety. This part (STAI-S) comprises 20 items, which participants answered with an indication of how they felt during the two days prior to the screening, on a 5-point scale that went from "Not at all" (0) to "A lot" (4).

Somatic Symptoms Scale (*Escala de Síntomas Somáticos*, ESS) by Sandín and Chorot (Sandín, Valiente & Chorot, 1999). We used the short form, which includes 17 items related to bodily sensations that usually accompany states of anxiety and panic reactions, such as feelings of dizziness, tachycardia, irritability, vertigo, or muscular trembling. Subjects answered the questionnaire indicating the extent to which they had experienced each of the symptoms during the two previous days, on an intensity scale from "Not at all" (0) to "A lot" (4). Data supporting the reliability and validity of the questionnaire have been provided by its authors (Sandín & Chorot, 1991). Data have also been offered on the temporal consistency of the ESS, obtaining test-retest correlations, for periods of one month, ranging from 0.73 to 0.82 (Santed et al., 1994). Given that the present short form of the ESS had not been used previously, we calculated the Cronbach's alpha coefficients, which were found to be as follows: 0.84 (SSS group) and 0.81 (RS group) for the pre-mammogram situation, and 0.79 (SSS group) for the post-mammogram situation (2 days).

Depression Questionnaire (*Cuestionario de Depresión*, CD) by Sandín and Valiente (Sandín et al., 1999). This is a 16-item questionnaire designed for rapid assessment of clinical depression, as opposed to mere depressive mood. The questionnaire was constructed on the basis of symptoms required in the DSM-IV (APA, 1994) for the diagnosis of major depression. It includes mood symptoms (e.g., "I spent the day crying or wanting to cry"), cognitive symptoms (e.g., "I found it difficult to think or concentrate") and somatic symptoms (e.g., "I slept well"). Participants responded to the questionnaire indicating the extent to which they had experienced each of the symptoms during the previous two days, on a frequency scale ranging from "Never or hardly at all" (0) to "Almost all the time" (4). In the present study we obtained alpha coefficients ranging from 0.88 (in the SSS group) to 0.89 (in the RS group), indicating that the questionnaire has high internal consistency. The Depression Questionnaire has convergent and discriminant validity, since it correlated strongly with other depression measures, and moderately or weakly with constructs such as worry, fear or psychopathic thoughts (Sandín, Chorot, Lostao, Valiente, Buceta & Fernández-Soto, 2000).

Procedure

All the psychological measures were applied by means of individual interviews. During the pre-mammography period we assessed sociodemographic information and applied the psychological measures. During the post-mammography condition we repeated the psychological measures, though only for the women in the SSS group. All women were interviewed individually by a (female) psychologist, who administered the questionnaire packages. The interviews corresponding to the post-mammography condition were made by telephone, an appointment having previously been arranged between the interviewer and the participant.

All participants were informed of the results of the mammogram. The women required to take a second screening received the medical information just after the interview and the medical examination. In accordance with the PDCM procedure, the women taking the routine screening received notification of the medical results by post, within approximately 15 days, unless the mammogram showed inconclusive or abnormal results, in which case they were notified by telephone, in a standard format, that they were required to take complementary tests within two days. The types of information given about the results of the medical examination (benign pathologies) were as follows (we indicate first the number of subjects of the SSS group assigned to each category of information, and second, the number in the RS group): no pathology (471 and 509), liquid cysts (88 and 46), fatty cysts (18 and 6), nodules or fibroadenomas (13 and 30), and calcifications (7 and 7).

RESULTS

Mean values corresponding to the five psychological variables during the pre-mammography condition are shown in Table 1. For statistical analysis of differences between groups we carried out *t* tests for independent

groups. As the table shows, there are significant differences between the groups for all the variables except somatic symptomatology (ESS) and depression (CD).

This suggests that psychological effects associated with the second-stage screening are related mainly to anticipatory anxiety prior to the medical examination, whether this anxiety is assessed by means of the STAI-S questionnaire or through self-rating. It can be observed, however, that the mean values of the SSS group are not high. Thus, for example, mean score in anxiety (self-rating) is 4.17, a value that indicates a moderate level of anticipatory anxiety. For the RS group, the anxiety level obtained by means of self-rating does not reach a value of 2, indicating that women who participated in the routine tests experienced low levels of anxiety. As regards anxiety measured by means of the STAI-S, given that the 20 items on this questionnaire were quantified using a 0-4 scale, a mean score of "moderate to severe anxiety" should attain at least a value of 40, a level considerable higher than those attained by either group of women.

As far as somatic symptomatology and depression are concerned, the mean scores indicate that neither those in the SSS group nor those in the RS group presented either somatic symptoms or depression associated with the breast cancer screening (the values for these two variables are low, and denote an absence of relevant somatic or depressive symptoms).

Figure 1 shows the percentages of women with scores from moderate to severe (scores between 5 and 10) in the self-rating variables (anxiety and depressive mood) and from "moderate" to "a lot" (scores between 40 and 80) in the STAI-S variable. As it can be seen, the frequencies, while not extremely high, are much greater in the three variables for the SSS group (χ^2 =154.32, df = 1, P < 0.001). Close to 50% of the women in the SSS group experienced significant levels of anxiety (self-rating), but only 11.2% of those in the RS group did so. Eighty-six (14.4%) of the women from the SSS group experienced between moderate and high anticipatory anxiety (STAI-S), but only 4 (0.7%) of those from the RS group.

The percentages of women from the SSS group that showed values from moderate to severe in these three psychological variables decreased drastically during the post-mammography condition (2 days later), with the figures as follows (number of subjects in brackets): 4% (24) for anxiety (self-report), 3.2% (19) for anxiety (STAI-S), and 3.7% (22) for depressive mood. As it can be seen, few women appear to experience anxiety and/or depressive mood during the days following the complementary mammography.

Finally, we were interested in determining pre-post differences in the values of these three variables for the women from the SSS group. Also, given that there were women who continued to experience significant levels of anxiety during the post-condition, it was important to study the possibility of its being related to the type of medical information provided to the women after the screening. For this purpose we carried out a repeated-measures analysis of variance (ANOVA) for each of the three dependent variables (i.e., anxiety by self-rating, anxiety by STAI-S, and depressive mood). The general ANOVA design used was a two-way (5x2) group (no

Figure 1
Percentage of women who presented during the pre-mammography condition scores from moderate to severe for the variables of anticipatory anxiety (anxiety by self-rating and STAI-S) and depressive mood. (SSS = second-stage screening, RS = routine screening).

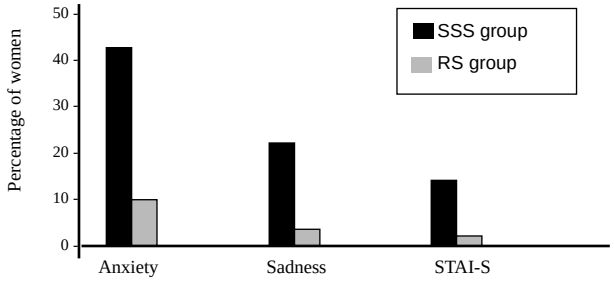

Table 1
Differences between groups in the pre-mammography condition

	SSS group (n = 597)		RS group (n = 598)			
Psychological variables	**Mean**	***SD***	**Mean**	***SD***	***t***	***p***
Anxiety (self-rating)	4.17	2.74	1.85	1.83	17.21	< 0.001
Depressive mood (self-rating)	2.82	2.50	1.83	0.92	14.52	< 0.001
State of anxiety (STAI-S)	29.18	8.29	19.87	5.30	23.05	< 0.001
Somatic symptoms (ESS)	5.01	6.04	4.20	5.11	1.74	ns
Depression (CD)	7.61	5.21	7.17	4.39	1.07	ns

Note: SSS = second-stage screening, RS = routine screening, ns = P > 0.05.

pathology vs. liquid cysts vs. fatty cysts vs. nodules or fibroadenomas vs. calcifications) x condition (pre- vs. post-mammography).

As Table 2 shows, mean values in anxiety (both measures) and depressive mood decrease drastically from the pre- to the post-condition. Moreover, taking into account these values, in general terms it can be affirmed that psychological effects seem to disappear completely two days after the second-stage screening and after receipt of the corresponding medical information. The ANOVAs carried out allowed us to confirm this phenomenon statistically, since the effect of the pre/post factor was significant for the three dependent variables studied [anxiety (self-rating): $F(1,592) = 73.7$, $P < 0.001$; anxiety (STAI-S): $F(1,592) = 1067.31$, $P < 0.001$; depressive mood: $F(1,592) = 14.29$, $P < 0.001$]. The effect of the group (type of information) factor was not found to be statistically significant for any of these three variables, despite the fact that women from the "calcifications" group presented higher mean levels than the rest of the women (see Table 2). Even though the interaction group x condition was not significant either, there was a trend towards statistical significance with regard to the two anxiety variables ($P < 0.09$ for anxiety by self-rating, $P < 0.06$ for anxiety by the STAI-S). This interactive trend suggests the existence of a low decrease in both forms of anxiety associated with positive report of calcifications.

DISCUSSION

The two main objectives of the present study were (1) to analyze the psychological effects or costs (basically anticipatory anxiety) for women attending a second-stage breast cancer screening, and (2) to determine whether this psychological impact disappeared within a short period of time (2 days after the examination). The data obtained indicate a significant level of psychological impact on anxiety, and a lower level on depressive mood. We did not find, however, a relevant effect on somatic symptomatology or depression (understood in terms of clinical depression, rather than mere sad or depressive mood).

With regard to the first issue, our data show that women in the second-stage screening (SSS) group experienced higher levels of anticipatory anxiety (evaluated both through self-rating and through the questionnaire) than the women in the routine screening (RS) group. These results, which suggest that there is greater psychological impact on women required to repeat the mammogram than on those not called back to repeat it, are congruent with those of Lerman et al. (1991) and Cockburn et al. (1994). In both studies the authors found significantly higher levels of psychological impact in women who were recalled for a second screening.

The absence of significant differences between the two groups of women in somatic symptomatology (ESS) and depression (CD) may be due to the fact that these varia-

Table 2
Means and *SD*s pre-/post-mammography in anxiety (self-rating and STAI-S) and depressive mood (self-report) for SSS (second-stage screening) group subjects according to type of information on pathology after mammography.

Variables according to type of information	Pre-mammography		Post-mammography	
	Mean	***DT***	**Mean**	***DT***
No pathology				
Anxiety (self-rating)	4.30	2.80	1.24	0.95
Depressive mood (self-rating)	2.92	2.58	1.23	1.02
State of anxiety (STAI-S)	29.46	8.55	4.37	9.72
Liquid cysts				
Anxiety (self-rating)	3.68	2.49	1.51	1.53
Depressive mood (self-rating)	2.60	2.24	1.49	1.49
State of anxiety (STAI-S)	28.07	7.47	6.48	13.94
Fatty cysts				
Anxiety (self-rating)	3.39	2.33	1.00	0.00
Depressive mood (self-rating)	1.89	1.53	1.00	0.00
State of anxiety (STAI-S)	27.61	7.06	3.28	6.44
Nodules/fibroadenomas				
Anxiety (self-rating)	3.46	2.44	1.23	0.60
Depressive mood (self-rating)	1.85	1.21	1.08	0.28
State of anxiety (STAI-S)	26.69	6.94	4.00	8.35
Calcifications				
Anxiety (self-rating)	5.00	3.37	2.43	2.99
Depressive mood (self-rating)	3.24	3.18	2.57	3.05
State of anxiety (STAI-S)	35.57	9.69	13.29	13.35

bles have greater psychopathological and clinical significance than the rest of the variables studied. The ESS (Somatic Symptoms Scale) questionnaire evaluates symptoms of autonomic activation and psychophysiological tension related to panic reactions and generalized anxiety disorder. The CD (Depression Questionnaire) provides a measure of depression, especially clinical depression. In our view, given that the extent of the emotional impact associated with second-stage screening is not high, we may expect: (1) not to find high scores in somatic symptoms and clinical depression, and (2) not to find significant differences between the two groups of women in these two variables. These results support the preliminary data published by Ellman et al. (1989), who found no significant differences in psychiatric morbidity (though they did find significant differences in anxiety) between women that participated in routine tests and those attending second-stage screening.

As we had expected, the psychological effects associated with second-stage screening seemed to disappear a short time after having taken the second screening and received reassuring information (i.e., information that there is no cancer or high risk of cancer). These results support the idea that the psychological effect related to this screening is a phenomenon of moderate intensity and short duration. Results in a similar direction were published recently by Clutton et al. (1999), who found that the psychological effects produced by second-stage breast cancer screening were practically irrelevant six weeks after the examination. Nevertheless, our data are in contrast to those of Lerman et al. (1991), who found that both anxiety and worry remained relatively high three months after the repeated mammogram. A problem with this last study, however, is that the assessment was carried out on a single occasion, and retrospectively.

The results of the present work suggest the existence of some emotional impact in women recalled for further mammography. The effects are not serious and are of short duration, since they are circumscribed to variables of emotional state and the time period between notification of the second appointment and receipt of information on the results of the second-stage screening. It seems clear, however, that a considerable percentage of the women who take such screening present high levels of anxiety and depressive mood (around 50% of such women in our sample experienced moderate to high levels of anxiety during the two days prior to the screening). Thus, although our data do not confirm the suggestion of some authors (Schmidt, 1990; Skrabaneck, 1985) that breast cancer screening, and in particular second-stage screening, may constitute – on generating the expectation of "false positives" – a potent source of serious psychological disturbance, it is nevertheless true that such screening may to some extent reduce women's quality of life, and at least affect some variables of emotional well-being.

If we take as a point of reference Marteau's (1994) emotion-cognition model, according to which mammography is associated with high uncertainty in women from the non-clinical population, it can be suggested that the second-stage screening constitutes a paradigmatic situation of the generation of uncertainty, and consequently of anticipatory anxiety and other possible negative emotion al responses. Given that, according to our data, the effects tend to be of short duration, remaining for the time that elapses between notification of the second appointment and receipt of the reassuring results, an important implication of the present work is that the best way of reducing the emotional impact on women would be to shorten this period as much as possible. It also emerges from the present study that the general strategy established by the PDCM team in Navarra is appropriate. Giving the reassuring information (i.e., the negative result) to the woman as soon as possible is an adequate method of reducing the negative effects. Anxiety levels might perhaps also be reduced by providing the woman, on notification of the second appointment, with some type of complementary information that would lower the level of uncertainty of the second screening. Such information might consist in informing her of the remoteness of the possibility of cancer or cancer risk, adducing technical reasons, including specific instructions, etc.

Finally, we have found that, even though the information was not sufficiently conclusive due to the small number of women affected (seven in the SSS group), women with calcifications tend to present high levels of negative impact during the two periods (pre- and post-). It is therefore perhaps necessary to provide such women with some kind of additional information – medical or psychological –, with the object of reducing their level of distress (and possibly of uncertainty), in addition to studying this benign pathology in more depth.

To the best of our knowledge, this is the first work focusing specifically on the study of psychological effects associated with second-stage breast cancer screening based on a representative sample of the population, employing temporal measures and using a control group of women who participated in routine screening. The results of our study serve to clarify some of the contradictory aspects referred to in the literature on the issue in question. Given that the emotional effects appear to be greater for some women than for others, it would be

important to analyze in future research the possible role of dispositional variables (e.g., neuroticism, attitudes towards disease) and social variables (e.g., social support) in this phenomenon.

A possible limitation of the present study resides in the fact that the interviews were applied face-to-face during the pre-mammography condition and by telephone during the post-mammography condition. Nevertheless, the possible effect of this on the results is minimal, since the interviews were conducted by the same psychologist and in a similar way in each case. Moreover, there is evidence that the telephone interview provides data as valid and reliable as that provided by the traditional interview (Zapka, Bigelow, Hurley, Ford, Egelhofer, Cloud & Sachsse, 1996).

ACKNOWLEDGEMENTS

The present study was supported by research grant nº 2204, *Resolución* 634/98, from the *Departamento de Salud del Gobierno de Navarra*. We should like to thank Dra. Nieves Ascunce and Dr. Ángel Del Moral for their help and suggestions.

REFERENCES

APA (American Psychiatric Association) (1994). *Diagnostic and statistical manual of mental disorders, 4th edition (DSM-IV).* Washington, DC: Author.

Ascunce, N. (1991). Mortalidad por cáncer en España. Movimiento natural de la población española. Prevención secundaria del cáncer. In J. Estapé & I. Burgos (Eds.), *Medicina General y Cáncer* (pp. 67-75). Barcelona: Doyma.

Ascunce, N., & Del Moral, A. (1993). Compliance in breast cancer screening: The Spanish experience. In A. Gad & M. Rosselli del Turco (Eds.), *Breast cancer screening in Europe* (pp. 47-53). Berlin: Springer-Verlag.

Chamberlain, J., & Palli, D. (1993). Evidence of the effectiveness of breast cancer screening. In A. Gad & M. Rosselli del Turco (Eds.), *Breast cancer screening in Europe* (pp. 15-23). Berlin: Springer-Verlag.

Clutton, S., Pakenham, K.I., & Buckley, B. (1999). Predictors of emotional well-being following a "false positive" breast cancer screening result. *Psychology and Health, 14,* 263-275.

Cockburn, J., Staples, M., Hurley, S., & De Luise, T. (1994). Psychological consequences of screening mammography. *Journal of Medical Screening, 1,* 7-12.

Ellman, R., Angelin, N., Christians, A., Moss, S., Chamberlain, J., & Maguire, P. (1989). Psychiatric morbidity associated with screening for breast cancer. *British Journal of Cancer, 60,* 781-784.

Gad, A., Rosselli del Turco, M.(1993). *Breast cancer screening in Europe*. Berlin: Springer-Verlag.

Lerman, C., Trock, B., Rimer, B.K., Jepson, C., Brody, D., & Boyce, A. (1991). Psychological side effects of breast cancer screening. *Health Psychology, 10,* 259-267.

Lostao, L. (1994). *Factores psicosociales asociados a la participación en un programa de prevención de cáncer de mama.* Madrid: UNED (doctoral thesis).

Marteau, T.M. (1994). Psychology and screening: Narrowing the gap between efficacy and effectiveness. *British Journal of Clinical Psychology, 33,* 1-10.

Rakowski, W., Stoddard, A.M., Rimer, B.K., Fox, A., Andersen, M.R., Urban, N., Lane, D.S., Costanza, M.E. (1997). Confirmatory analysis of opinions regarding the pros and cons of mammography. *Health Psychology, 16,* 433-441.

Sandín, B., & Chorot, P. (1991). *Escala de Síntomas Somáticos (ESS)*. Poster presented at III Congress of Psychological Assessment. Barcelona, 25-28 September.

Sandín, B., Chorot, P., Lostao, L., Valiente, R.M., Buceta, J.M., & Fernández-Soto, O. (2000). *Afectación psicológica en mujeres que acuden a pruebas complementarias en un programa de screening de cáncer de mama.* Madrid: UNED (unpublished).

Sandín, B., Valiente, R.M., & Chorot, P. (1999). Evaluación del estrés psicosocial. In B. Sandín (Ed.), *El estrés psicosocial: Conceptos y consecuencias clínicas* (pp. 245-316). Madrid: Klinik.

Santed, M. A., Chorot, P., Sandín, B., Jiménez, M. P., & García-Campayo, J. (1994). *Stress assessment: A new microevents scale*. Poster presented at 23rd International Congress of Applied Psychology. Madrid, 17-22 July.

Schmidt, J.G. (1990). The epidemiology of mass breast cancer screening - A plea for a valid measure of benefit. *Journal of Clinical Epidemiology, 43,* 215-225.

Skrabanek, P. (1985). False premises and false promises of breast cancer screening. *Lancet,* 316-320.

Spielberger, C.D., Gorsuch, R.R., & Lushene, R.E. (1982). *STAI. Cuestionario de Anxiety Estado/Rasgo.* Madrid: TEA.

Zapka, J.G., Bigelow, C., Hurley, T., Ford, L.D., Egelhofer, J., Cloud, W.M., & Sachsse, E. (1996). Mammography use among sociodemographically diverse women: The accuracy of self-report. *American Journal of Public Health, 86,* 1016-1021.

Wardle, J., & Pope, R. (1992). The psychological costs of screening for cancer. *Journal of Psychosomatic Research, 36,* 609-624.