

Stunkard Figure Rating Scale and Sexuality During Pregnancy. A Longitudinal, Pilot Study

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Abstract

Body image and body weight may be associated with sexuality in pregnant women. Twenty pregnant women filled in the two-factor McCoy Female Questionnaire, the Stunkard Figure Rating Scale and the Beck's Depression Inventory Questionnaire. In the pregnant women, the number of intercourses/week and the McCoy Female Questionnaire score for sexuality significantly decreased. The Stunkard Figure Rating Scale evidenced that the "actual body" silhouette score increased during the third trimester of pregnancy and that the women worsened the feeling with their own body image. Changes in body appearance, during pregnancy, and the women's fear of being less attractive for their partners may have lasting effects on sexuality.

Keywords: Body image; Figure Rating scale; Beck Depression Inventory; Mc coy female sexuality questionnaire; Pregnancy; Sexuality

Introduction

Sexuality, far more than a simple biologic reaction to visual, auditory, or tactile stimuli, should be considered as a state of physical, emotional, mental and social well-being related to sexual activity [1]. Cultural, religious and social factors may modulate female sexuality. Sexuality is an important component of health and well-being in the entire woman's life and pregnancy may be considered a unique period and a cornerstone of the couple's experience. During pregnancy, women undergo physiological (cardiovascular, hematologic, metabolic, hormonal, respiratory) and anatomical changes that have an important impact on their sexual behavior.

Although [2] in a subset of pregnant women, observed an increase in sexual desire and sexual satisfaction, however, several authors underlined that pregnancy, particularly in the third trimester, dramatically decreases the frequency of intercourses [3-5]. Pregnancy-related nausea and vomiting, progressive increase in abdominal size and higher breast sensitiveness may result in physical discomfort during sex and diminish the couple's interest in sexual interactions [6-9]. Furthermore, fears and myths, such as the association between sexual intercourse and fetal injury, miscarriage, bleeding, infections and preterm delivery have often been reported as reasons for avoiding sex during pregnancy [10-13]. In addition, even though gaining weight is normal in pregnancy, 25-50% of pregnant women feel themselves less attractive [11] and most studies demonstrate a negative shift in body image satisfaction from the pre-pregnancy period to the end of pregnancy [14].

Finally, the transition to motherhood can cause mild depression from 7% [15] to 51% [16] of the cases and the consequent depressed mood and emotional liability could be negatively correlated with sexual desire and sexual satisfaction [15]. Consequently, most women report a progressive decline in sexual activity and orgasmic

responsiveness throughout pregnancy with the worst sexual performances during the third trimester of gestation.

The aim of the present prospective pilot study was to longitudinally evaluate, in young, healthy pregnant women, the effects of weight gain and perceived body image on sexuality, stress and partnership.

Materials and Methods

Subjects

Between January 2013 and December 2014, twenty-six (native Italians) adult (25-35 years) primigravidae, healthy women with a stable heterosexual relationship (>1 year) and with a planned and wanted pregnancy, were considered eligible for the study. The patients were selected and progressively recruited among those attending the Obstetric Clinic of S. Orsola-Malpighi Hospital after written informed consent. The study protocol was in accordance with the Helsinki II declaration and was part of a larger study previously approved by the Departmental Review Committee.

The study was not advertised, and no remuneration or reimbursement was offered to the women. No external funds were provided for the study. At 6-8 weeks of gestation, after demonstration of a single viable embryo by ultrasound, patients were recruited for the study. All women were counseled about sexuality in pregnancy (i.e. hormonal and body changes, sexual position in pregnancy, safety of sexual intercourse, etc.), as per routine protocol in our Clinic, and they were assessed with a detailed history and a medical and obstetric examination. Standing height and weight were measured and the Body Mass Index (BMI) was calculated. Subsequently, the subjects were examined during their first (10-12 weeks of gestational age), second (18-20 weeks), and third trimester (30-32 weeks) routine visits.

All selected women were non-smokers, made no use of psychoactive drugs, recreational substances or alcohol, did not present neurological, psychiatric, cardiovascular, and endocrine disorders. Patients with pre-gestational hypertension (systolic blood pressure >135 mmHg and/or diastolic pressure >85 mmHg), bronchial asthma, diabetes, renal, or

hepatic illness were not included in the study. Further exclusion criteria were uterine malformations or pathology (i.e. myomas), ovarian resection or ovariectomy, urological and proctologic diseases, a history of perineal surgery or trauma and pregnancy after assisted reproductive technologies.

In addition, we excluded women undergoing chorion villus sampling or amniocentesis and those who developed fetal or obstetric complications (e.g. placenta previa, cervical incompetence, intrauterine growth restriction, oligohydramnios, preeclampsia/eclampsia, gestational diabetes) during the three trimesters of pregnancy.

Study design

Two women were uninterested in completing the study. During the observational period, 3 patients had intrauterine growth restriction and/or oligohydramnios, and 1 developed gestational diabetes, and were excluded from the study. Therefore, 20 subjects fulfilled the inclusion criteria and completed the study.

They underwent, in each trimester of pregnancy, to clinical and ultrasonographic evaluation of feto-maternal well-being and each woman filled in Stunkard Figure Rating Scale (FRS) [17], the two-factor Italian McCoy Female Questionnaire (MFSQ) [18,19], and the Beck's Depression Inventory Questionnaire (BDI) [20]. All questions on sex were exclusively related to vaginal intercourse. No data were collected in relation to other type of sexual activity during pregnancy (masturbation, anal or oral intercourse).

All women delivered at our Hospital; pre-delivery maternal weight, type of delivery (vaginal route/cesarean section) and birthweight were recorded.

Behavioral assessment

On the same days, in a separate room, and just before that visits took place, the subjects completed the questionnaires on body image, depression and sexuality. The Stunkard Figure Rating Scale [17] consists of a gender specific scale that contains nine schematic figures ranging from an underweight silhouette (n=1) to an extremely obese silhouette (n=9). Furthermore, the subjects were asked to indicate the ideal weight, and to select the actual body silhouette and the silhouettes that they perceived as ideal, most attractive and closest to their current body silhouette.

They were asked to identify the body shape that they perceived as most attractive for their partner. Furthermore, were also asked how they were satisfied of their own body (score 1-5: null-too much) and

how they felt good because of their silhouette (score 1-5: null-too much).

The two-factor Italian McCoy Female Sexuality Questionnaire [18,19] is an easy, widely and quick validated tool to adequately discriminate between women with and without sexual dysfunction measuring on a seven-point Likert scale's two dimensions: sexuality (desire, orgasm, arousal, pain and satisfaction) and partnership (partner's sexual health, feeling and relationship; items 8, 9, 10, 11, 19). For both dimensions, the total score was analyzed. The item 12 (number of intercourse/week), 14 (frequency of orgasm during intercourse; score 1-7: never-always), 15 (orgasm intensity; score 1-7: unpleasant-highly pleasant), and 18 (pain during intercourse; score 1-7: always-never) were evaluated separately.

The Beck Depression Inventory [20] is a well-validated 21 item self-administered rating inventory measuring characteristic attitudes and symptoms of depression (sadness, pessimism, dislike of self, change in body image, fatigability, etc.). The score on each of 21 questions is 0-3 (absent to severe), and then the highest possible total for the whole test is 63. Values up to 9 are considered normal; 10-18 express a mild/moderate depression; 19-29 moderate/severe depression; 30-63 severe depression.

Statistical analysis

The data were managed and analyzed by using the IBM SPSS Statistics (IBM Co., Armonk, NY, USA; version 23) and two-tailed P values less than 0.05 were considered as statistically significant. Statistical analysis was performed using the the Friedman test with Dunnett post hoc correction. The relationship between the different parameters was analyzed using the Pearson's regression. Data are presented as mean Standard Deviation, unless otherwise indicated.

Results

Mean maternal age at the first screening visit was 29.8±4.1 years, the mean body weight was 69.5 ± 9.2 kg, and the mean BMI was 24.2 ± 3.4 kg/m². At the end of pregnancy the mean weight gain was 13.9 ± 6.6 kg. All subjects delivered at term: 13 (65%) by vaginal route and 5 (35%) by cesarean section due to acute fetal distress. Mean birth weight was 3.268 ± 417 g. All the couples remained sexually active during the entire study duration.

In the studied healthy, not sexually aroused, pregnant women, the MFSQ score for sexuality significantly decreased during the third trimester (Table 1).

Behavioral Profile	1st Trimester	2nd Trimester	3rd Trimester	Significance		
				I vs. II	I vs. III	II vs. III
Depression						
BDI	7.9 ± 5.5	7.8 ± 5.4	8.8 ± 2.6	-	-	-
Sexuality						
MFSQ Sexuality	41.9 ± 8.5	48.9 ± 7.1	33.7 ± 8.7	-	0.01	0.0001
Partner	29.5 ± 5.4	28.0 ± 7.1	24.0 ± 7.3	-	-	-

Intercourse/week (n)	1.9 ± 1.6	1.4 ± 1.1	0.9 ± 0.4	-	0.04	-
Orgasmic frequency	4.8 ± 1.7	4.9 ± 1.7	5.0 ± 1.0	-	-	-
Orgasmic intensity	5.5 ± 2.2	5.1 ± 1.0	5.4 ± 2.0	-	-	-
Pain	5.7 ± 1.6	5.5 ± 1.8	4.6 ± 1.6	-	-	-

BDI= Beck Depression Inventory; MFSQ=McCoy Female Sexuality Questionnaire; All the values express a score.

Table 1: Behavioral Profile, during pregnancy, in 20 normal, healthy subjects.

The MFSQ score relating to partnership slightly decreased but did not significantly change (Table 1). The number of intercourses/week significantly decreased throughout pregnancy (Table 1). The item 14 (frequency of orgasm during intercourse), 15 (orgasm intensity), and 18 (pain during intercourse) did not change (Table 1) during pregnancy.

the figure that represented their own ideal, the figure they considered most feminine and to that they considered most attractive for their partner unchanged during pregnancy (Table 2). The "actual body" silhouette increased during the third trimester of pregnancy (Table 2) and women worsened the feeling with their own silhouette (Table 2).

The Stunkard Figure Rating Scale evidenced that among the nine silhouettes representing how the studied women usually feel they look,

Behavioral Profile	1st Trimester	2nd Trimester	3rd Trimester	Significance		
				I vs. II	I vs. III	II vs. III
Body Image*						
Actual body silhouette	4.2 ± 1.1	4.5 ± 0.9	5.4 ± 0.8	-	0.03	-
Ideal silhouette	3.1 ± 0.9	3.0 ± 0.7	3.1 ± 0.9	-	-	-
Most attractive silhouette	3.1 ± 0.8	3.0 ± 0.7	3.1 ± 0.9	-	-	-
Most attractive silhouette for partner	3.1 ± 0.8	3.1 ± 0.7	3.0 ± 0.9	-	-	-
Satisfaction of their own body	3.3 ± 1.0	3.0 ± 0.9	3.0 ± 1.3	-	-	-
Feeling good with their own silhouette	3.5 ± 0.9	3.2 ± 1.0	2.7 ± 0.9	-	0.047	-

*All the values express a score

Table 2: The Stunkard figure rating scale and body image during pregnancy, in 20 normal, healthy subjects.

The values of BDI slightly increased but not significantly changed during pregnancy (Table 1). The relationship analysis between the various parameters showed that Stunkard Figure Rating Scale

silhouettes correlate with weight modifications and with the total score of both MFSQ sexuality and partnership (Table 3).

Behavioral Profile	Actual body silhouette	Ideal silhouette	Most attractive silhouette	Most attractive silhouette for partner	Satisfaction of their own body	Feeling good with their own silhouette
Kg	r=0.543 P=0.018	r=-0.386 P=0.078	r=-0.225 P=0.210	r=-0.225 P=0.210	r=-0.311 P=0.130	r=-0.359 P=0.095
BMI	r=0.595 P=0.010	r=-0.362 P=0.093	r=-0.208 P=0.229	r=-0.208 P=0.229	r=-0.237 P=0.197	r=-0.157 P=0.288
BDI	r=-0.324 P=0.119	r=-0.257 P=0.178	r=-0.199 P=0.239	r=-0.199 P=0.239	r=-0.070 P=0.403	r=-0.157 P=0.288
MFSQ sexuality	r=-0.467 P=0.040	r=-0.554 P=0.016	r=-0.473 P=0.037	r=-0.471 P=0.039	r=0.375 P=0.084	r=0.321 P=0.122
MFSQ partner	r=-0.649 P=0.004	r=-0.589 P=0.010	r=-0.417 P=0.061	r=-0.421 P=0.058	r=0.471 P=0.038	r=0.231 P=0.204
Intercourse/week	r=0.198 P=0.239	r=0.179 P=0.261	r=0.268 P=0.167	r=0.270 P=0.170	r=0.229 P=0.430	r=0.125 P=0.328
Orgasmic frequency	r=-0.462 P=0.188	r=-0.244 P=0.191	r=-0.397 P=0.072	r=-0.388 P=0.077	r=-0.044 P=0.438	r=-0.059 P=0.418

Orgasmic intensity	r=-0.414 P=0.062	r=-0.362 P=0.093	r=-0.409 P=0.065	r=-0.389 P=0.075	r=0.143 P=0.305	r=0.085 P=0.382
Pain	r=-0.208 P=0.229	r=-0.046 P=0.436	r=-0.051 P=0.428	r=-0.079 P=0.468	r=0.170 P=0.272	r=0.257 P=0.177

BDI: Beck depression inventory (score); BMI: Body mass index (score); MFSQ: Mc coy female sexuality questionnaire for sexuality and partnership (Scores). The results in bold are the significant values.

Table 3: Relationship among the changes of Stunkard Figure Rating Scale and behavioral profile during pregnancy in 20 healthy subjects.

Discussion

During pregnancy, women undergo physiological and anatomical changes that have an important impact on their sexual behavior. Furthermore, body image, body weight and body mass index may be associated with sexual satisfaction and the frequency and comfort of sexual behavior in pregnant women [3,21-23]. Several authors underlined that pregnancy, particularly in the third trimester, decreases the frequency of intercourses [3,5,24]. Furthermore, sexual satisfaction decreases in pregnant women [11,23,25] favoring a decline in orgasm frequency and intensity and an increase in vaginal pain.

In the present longitudinal study, we selected healthy pregnant married women without sexual dysfunction. All the couples remained sexually active during the entire study duration.

In our studied healthy, not sexually aroused, pregnant women, in agreement with [11], we showed that the frequency and intensity of orgasm during intercourse did not change during pregnancy. Similarly, the vaginal lubrication and the perceived pain during intercourse did not change. However, the coital frequency (intercourse/week) significantly decreased in the third trimester of pregnancy. Furthermore during the third trimester, significantly decreased the total MFSQ score for sexuality.

Sexual difficulties during pregnancy other than to be correlated with deep engagement of fetal head, hemorrhoids, subluxation of pubic symphysis and sacroiliac joints, may be psychological in origin, occurring as an emotional response to motherhood. Anxiety of delivery, emotional liability, and depressive mood may be associated with decreased sexual satisfaction [22]. The BDI is a well-validated self-administered rating inventory measuring characteristic attitudes and symptoms of depression. In the studied population the values of BDI did not change during the three trimesters and did not result correlated with sexuality or body image disturbances. We think that because all pregnancies were planned and desired, because the absence of any pathology and the precise counseling regarding sexuality in pregnancy (i.e. hormonal and body changes, sexual position in pregnancy, safety of sexual intercourse, etc.), the women had the self-consciousness that a physiological pregnancy is not a stressful event and may bring joy and happiness.

Literature data have shown pregnant women's negative perception of their body with the development of the pregnancy [26]. In all subjects, the increased weight and BMI during pregnancy was associated with Stunkard Figure Rating Scale modifications. It was evidenced that the perceived "actual body" silhouette increased during the third trimester of pregnancy and that it was associated with the women worsened feeling with their own silhouette.

Body fat may be estimated by objective (BMI) or subjective (FRS) surrogated measures, and both types of measurement are useful to evaluate the relationship between body weight and body image [27]. The FRS is a measure of body image perception [17]. It is a

multifaceted construct referring to women's subjective perception of and attitudes about their own body, with an emphasis on physical appearance.

The body appearance can be subjectively assessed by body image analysis. There are many methods to assess body image. In our study we used the Figure Rating Scale adapted by Stunkard's [17]. As with other techniques, FRS has several limitations. Among those we identified the lack of figures presenting very obese people; the figures illustrated in the questionnaire are not realistic enough, do not account for height of individuals, and do not allow any division into central and peripheral obesity. Furthermore, perceived body images may vary among those of different age, racial or ethnic group, and in relation to the psychological profile. These factors make interpretation and statistical analysis more difficult [28]. However, all the patients were Italians and were similar for age and BMI. Despite the above limitations, FRS presents some advantages: it facilitates a uniform approach and is not an overly time-consuming procedure. Furthermore, FRS does not differ from other assessment methods [29]. Moreover possible limitations of the present study are related with the low number of studied subjects and the young age of the population we analysed.

Body image disturbance is a distortion of perception, behavior, or cognition related to body weight or shape. In the studied subjects, a negative relationship was found between the perceived "actual body", "ideal" silhouettes and "satisfaction of their own body", and MFSQ score relating to partnership. Changes in appearance and fear of being less attractive for their partners may have influenced coital frequency and total MFSQ score for sexuality. Some studies described a decrease in the quality of the couples' relationship due both to the challenges posed by stressful body changes associated with the pregnancy and to the women amplified need for relational security, affection and expressions of love [30-31]. Furthermore, in the third trimester of pregnancy, reduced fear of imminent paternity, reduced emotional closeness and intimacy with the female partner, may be responsible of the possible decline of sexual desire.

Limitations

We believe that the present prospective study has some limitations. Firstly, the study was conducted only in a small homogeneous and selected (age, weight, parity, ethnicity, cultural level) and selected (physiological pregnancy) group. Furthermore, we only assessed sexual activities among married women without sexual dysfunction who voluntarily participated in the study and no data were reported about those who refused to be enrolled. Therefore, it is unclear whether our findings can be applied to the general obstetric population. In addition, we think that the analysis of self-reported answers did not confirm the information with the partners and that the self-administration of a behavioural questionnaire is a potential bias that may lead to misclassification due to under- or over-reporting, which would

decrease any potential association between pregnancy, body image and sexuality. Finally, women were followed longitudinally throughout their pregnancy, beginning in the first trimester, and no data on sexuality were reported for the pre-pregnancy period, the last two months of pregnancy and the post-partum.

Conclusions

A significant proportion of women are concerned that changes in their body during pregnancy may have lasting effects on sexuality. Further and more extensive studies are necessary to better understand the complex relationship between pregnancy adaptive processes and couple's sexuality.

Declaration of interest statement

The authors of this paper certify that they have no affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

References

1. World Health Organization (2002) Sexual health: Working definitions.
2. Haugen EN, Schmutzer PA, Wenzel A (2004) Sexuality and the partner relationship during pregnancy and the postpartum period. In: Harwey JH, Wenzel A, Sprecher S (Eds.) *Handbook of sexuality in close relationship*, Mahwah, NJ, pp. 411-435.
3. Pauls RN, Occhino JA, Dryfhout VL (2008) Effects of pregnancy on female sexual function and body image. A prospective study. *J Sex Med* 5: 1015-1022.
4. Aslan G, Aslan D, Kizilyar A, Ispahi C, Esen A (2005) A prospective analysis of sexual function during pregnancy. *Int J Impot Res* 17: 154-157.
5. Hackel LS, Ruble DN (1992) Changes in the marital relationship after the first baby is born: predicting the impact of expectancy disconfirmation. *J Pers Soc Psychol* 62: 944-957.
6. Glazener CMA (1997) Sexual function after childbirth: women's experiences, persistent morbidity and lack of professional recognition. *Br J Obstet Gynaecol* 104: 330-335.
7. Lumley J (1978) Sexual feeling in pregnancy and after childbirth. *Aust N Z J Obstet Gynaecol* 18: 114-117.
8. Sagiv-Reiss DM, Birnbaum GE, Safir MP (2012) Changes in sexual experiences and relationship quality during pregnancy. *Arch Sex Behav* 41: 1241-1251.
9. Bird IM, Zhang L, Magness RR (2003) Possible mechanisms underlying pregnancy-induced changes in uterine artery endothelial function. *Am J Physiol Regul Integr Comp Physiol* 284: R245-58.
10. von Sydow K (1999) Sexuality during pregnancy and after childbirth: A metacontent analysis of 59 studies. *J Psychosom Res* 47: 27-49.
11. Ficek L, Miotła P, Rechberger T (2005) Women's sexual life quality assessment with use of questionnaires in clinical trials-review of accessible tools, their characteristics and comparison of their properties. *Ginekol Pol* 76: 1000-1007.
12. Meston CM, Derogatis LR (2002) Validated instruments for assessing female sexual function. *J Sex Marital Ther* 1: 155-64.
13. Goodwin A, Astbury J, McMeeken J (2000) Body image and psychological well-being in pregnancy: A comparison of exercisers and non-exercisers. *Aust N Z J Obstet Gynaecol* 40: 442-447.
14. Bennett HA, Einarson A, Taddio A, Koren G, Einarson TR (2004) Prevalence of depression during pregnancy: Systematic review. *Obstet Gynecol* 103: 698-709.
15. Zayas LH, Cunnigham M, McKee MD, Jankowski KR (2002) Depression and negative life events among pregnant African American and Hispanic women. *Womens Health Issues* 12: 16-22.
16. Stunkard AJ, Sorensen T, Schulsinger F (1983) Use of the Danish adoption register for the study of obesity and thinness. *Genetics of neurological and psychiatric disorders*. Raven Press, New York, pp. 115-120.
17. Rellini AH, Nappi RE, Vaccaro P, Federghini F, Abbiati I, et al. (2005) Validation of the McCoy Female sexuality Questionnaire in an Italian sample. *Arch Sex Behav* 34: 641-647.
18. Nappi RE, Federghini F, Sampaolo P, Vaccaro P, De Leonardis C, et al. (2006) Clitoral circulation in postmenopausal women with sexual dysfunction: A pilot randomized study with hormone therapy. *Maturitas* 55: 288-295.
19. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J (1961) An inventory for measuring depression. *Arch Gen Psychiatry* 4: 561-571.
20. Ackard DM, Kearney-cook A, Peterson CB (2008) Effect of body image and self-image on women's sexual behaviors. *Int J Eat Disord* 28: 422-429.
21. Pujols Y, Meston CM, Seal BN (2010) The association between sexual satisfaction and body image in women. *J Sex Med* 7: 905-916.
22. DeJudicibus MA, McCabe MP (2002) Psychological factors and the sexuality of pregnant and postpartum women. *J Sex Res* 39: 94-103.
23. Leite A, Campos A, Cardoso Diaz AR, Amed AM, De Souza E (2009) Prevalence of sexual dysfunction during pregnancy. *Rev Assoc Med Bras* 55: 563-568.
24. Gokylidiz S, Beji NK (2005) The effects of pregnancy on sexual life. *J Sex Marital Ther* 31: 2010-2015.
25. Chang SR, Ho HN, Chen KH, Shyu MK, Huang LH, et al. (2012) Depressive symptoms as a predictor of sexual function during pregnancy. *J Sex Med* 9: 2582-2589.
26. Morotti E, Battaglia B, Paradisi R, Persico N, Zampieri M, et al. (2013) Body mass index, Stunkard figure rating scale, and sexuality in young Italian women: A pilot study. *J Sex Med* 10: 1034-1043.
27. Russel CJ, Pinto JK, Bobko P (1991) Appropriate moderated regression and inappropriate research strategy: A demonstration of information loss due to scale coarseness. *Appl Psychol Meas* 15: 257-266.
28. Grunzka W, Olszanecka-Glinianowicz M, Kocelak P, Wikarek T, Dąbrowski P, et al. (2011) Body self-perception in subjects beginning a three-month multifaceted group weight loss programme. *Arch. Psychiatry Psychother* 2: 31-35.
29. Belsky J, Rovine M, Fish M (1989) The developing family system. In: Gunnar MR & Thelen E (Eds), *System and development: The Minnesota Symposia on child psychology*, Hillsdale, NJ, pp: 135-158.
30. Levy-Shiff R (1994) Individual and contextual correlated of marital change across the transition to parenthood. *Dev Psychol* 30: 591-601.
31. Wilkinson RB (1995) Changes in psychological health and the marital relationship through childbearing. Transition or process as stressor. *Aust J Psychol* 47: 86-92.