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Back Pain during Pregnancy and Quality of Life of Pregnant Women

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Abstract

Background: This study aimed to compare the quality of life (QOL) of women with low back pain and women without low back pain during pregnancy.

Methods: We conducted a cross-sectional study on pregnant women recruited in a hospital maternity or in primary care settings. Data collection was carried out through a self-administered questionnaire including the QOL Short Form Health Survey SF12-V2 scale. Independent sample t-tests were calculated to compare differences in QOL between women with and without low back pain. Multivariate regression models then examined the effect of low back pain on QOL, adjusting for covariate factors.

Results: Among the 218 pregnant women included in the study, 137 were suffering from low back pain (LBP). The mean intensity of pain (numerical scale) in the LBP group was 5.04 ± 1.73 (range 0 to 10 for maximum pain). Among women with low back pain, 21% of them (n=29) reported having received the following treatments for their pain. There was a significant difference in the quality of life between the group of women with low back pain (LBP) and the one without low back pain (NLBP) in the areas of mental health, physical health as well as social relations. The mental health and social relationships dimensions seemed more affected than the physical scores.

Conclusion: Low back pain decreased physical and psychosocial health during pregnancy. A greater support should be promoted in the medical follow-up of pregnant women with low back pain.

Keywords: Back pain; Pregnancy; Pregnant women

Introduction

Low back pain is a frequently reported complaint during pregnancy [1-3]. According to a Cochrane literature review more than two-thirds of pregnant women suffered from back pain during their pregnancies [4]. These pains often remain underestimated and undertreated [1-3]. According to Skaggs et al. [5] 85% of patients suffering from back pain did not receive any treatment from their caregiver and among those who were treated, only 1% stated that they were relieved by the proposed therapy.

The known risk factors of low back pain during pregnancy are previous history of back pain, maternal age and multiparity and physical activity [1,2,6]. Increase in Body Mass Index during pregnancy is a much-debated risk factor in the occurrence of low back pain [7]. The consequences in terms of economic impact have been described in several publications. In a study by Skaggs et al., these pains were found to be at the origin of many sick leaves during pregnancy [5]. A recent Norwegian study reported an average duration of 6.5 weeks of sick leave as a result of moderate lumbar pain [8]. This subject would therefore be important from a public health perspective in Scandinavian countries with an estimated cost of $2.5 million in 1990 [9].

During pregnancy, the occurrence of low back disorders could have global consequences involving physical, psychological and social impacts among women and their unborn children [4,10]. Few studies have evaluated the impact of these pains on the quality of life and the progress of the pregnancy; the results of these studies are controversial. In France, no data are available on this subject [11-13]. The main objective of our study was to determine the relation between low back pain and quality of life of pregnant women. The secondary objective was to find a correlation between the intensity of pain related to low back disorders and Quality of Life (QOL) scores.

Materials and Methods

Design of the study and population

A cross-sectional study was conducted between May and December 2013. The research sample consisted of 361 pregnant women going for regular checkups at the Pitié Salpêtrière maternity hospital (Paris) or at primary care settings including general medicine and midwife practices (in three departments in Parisian suburbs: Val-de-Marne, Seine-et-Marne and Hauts-de-Seine). Inclusion criteria were all pregnant women speaking French with a singleton pregnancy. Exclusion criteria were women consulting the gynecologic obstetric emergencies as well as those hospitalized. Participants were excluded from the study when having an adverse obstetric history (stillbirth, neonatal death, preterm birth or low birth weight in a previous pregnancy) or a high-risk pregnancy (gestational diabetes, gestational hypertension, hemorrhage during the second or third trimester, abnormal fetal growth or hospitalization for threatened preterm labor).

Data collection

Data for this study were collected through self-administrated questionnaires. Eligible women were invited to participate in the study during their prenatal consultations. Low back disorders were defined

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as pain beside the lumbo-sacral spine, located at the iliac crests level or lower, central or lateral. A body diagram helped differentiate low back disorders from sacro-iliac pain. The first part of the questionnaire was devoted to pregnant women's socio-demographic and medical information and to the localization of low back disorders. A second part was devoted to the measurement of the quality of life.

Studied variables

The quality of life was measured through the questionnaire SF-12v2 (Short Form with 12 items). This is a validated tool in the international literature to measure the QOL and it is commonly used worldwide [14]. This tool is easy to use in its short version, with only 7 questions, and explores the eight main areas of health of the SF-36: physical functioning, physical role, bodily pain, general health, vitality, social functioning, emotional role and mental health. Two general scores summarize the physical component (PCS) and the mental component (MCS). It is a self-administered survey requiring short filling time (estimated at approximately 2 min). An updated version was developed by researchers specialized in QOL assessment. It has good psychometric properties as demonstrated in numerous studies.

The socio-demographic and medical characteristics considered were: age, term of pregnancy, body mass index (BMI) before the pregnancy, couple's marital situation, number of children, socio-professional category and back pain background outside of pregnancy. The presence of low back pain was assessed through a single question and was completed by a drawing indicating the exact location of the pain. The intensity of pain was evaluated using a numerical scale rated from 0 to 10. The medical treatment (including analgesics) was clearly reported.

Number of subjects needed

The number of required subjects was assessed on the basis of a difference of 4 on the score of quality of life (52 for group 1 versus 48 for group 2), a standard deviation of 10, a power of 80% and an alpha risk of 5%. In order to observe a significant difference between the two groups, a total of 156 subjects were needed. The statistical analysis (standard deviation, confidence interval, risk *p*) was carried out using the SAS Software 2.1 based on an Excel database summarizing the results.

First, the analysis included a description of the population and the quality of life of pregnant women. The QOL between the two groups, with and without low back pain, was then compared. Comparisons used Chi-square or Student tests as appropriate. Then associations were studied taking into account the following socio-demographic characteristics: maternal age, term of pregnancy, couple situation, women's socio-professional category, back pain history and place of recruitment (hospital or primary care settings). Statistical significance was defined as $p<0.05$. The statistical analyses were performed using the SAS 9.2 software (SAS Institute Inc., Cary, NC, USA).

Ethics committee

The questionnaire was distributed in the waiting room by two investigators. The research protocol had been validated by the Advisory Committee on the Treatment of Information in Research (CCTIRS).

Results

Out of the 339 women invited to participate in the study, 77 (22.7%) refused to participate and 44 (13.0%) were ineligible (Figures 1-3). 262 (77.3%) questionnaires were collected and 218 (64.3%) pregnant

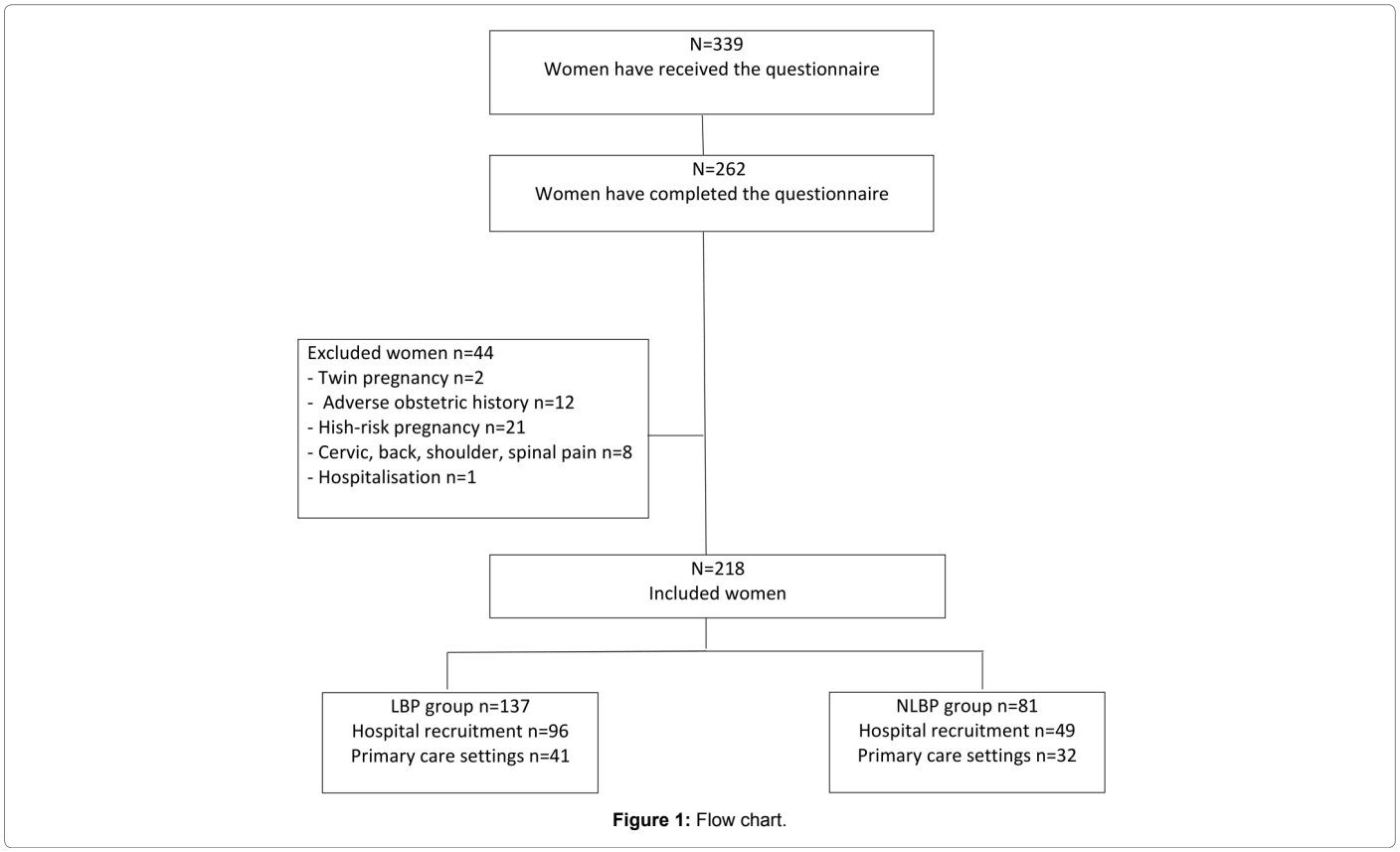


Figure 1: Flow chart.

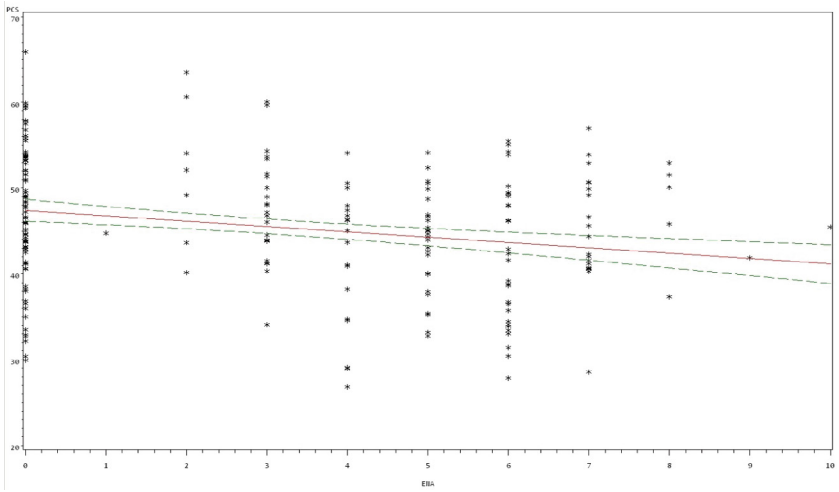


Figure 2: Correlation between the intensity of the pain and the PCS score.

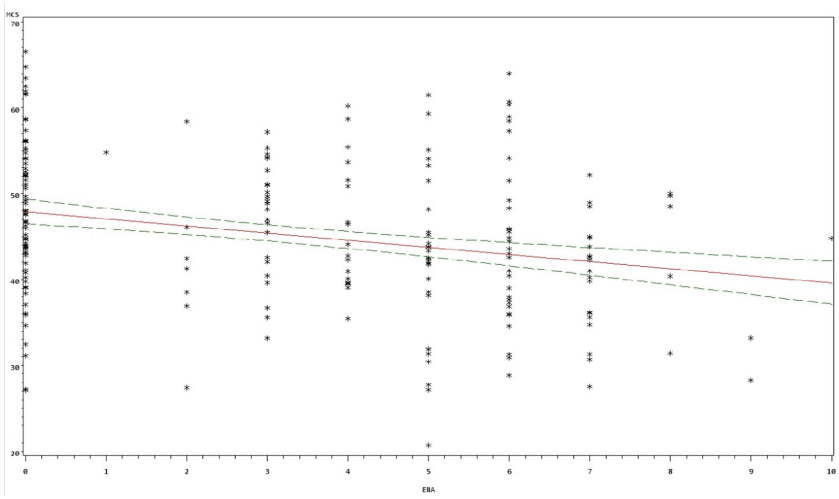


Figure 3: Correlation between the intensity of the pain and the MCS score.

women were included, divided into two groups: "Group with low back pain" (LBP, n=137) and "Group without low back pain" (NLBP, n=81).

Women's characteristics

Women in our sample were aged 18 to 44 years. They mainly lived with a partner and were more often primiparous women (Table 1). Women recruited at hospital or primary care settings had similar socio-demographic characteristics, except for women recruited at hospital who more often tended to live alone (respectively 11.8% and 4.11%, p=0.06) (data not shown).

The mean intensity of pain (numerical scale) in the LBP group was 5.04 ± 1.73 (range of 0 to 10 for maximum pain). At the first, second, and third trimester, it was respectively 1.44 ± 0.93, 2.84 ± 0.37 and 3.40 ± 0.23 (p=0.07). Among women with low back pain, 21% (n=29) reported having received the following treatments for such pain: osteopathy (7 women), paracetamol (6 women), acupuncture (4 women), physiotherapy (3 women), phloroglucinol (3 women), lumbar belt (1 women), magnesium (1 woman) or combination of these treatments (4 women).

Comparison of QOL scores

Prior to the adjustment of statistical analyses, women with low back disorders had lower physical scores with PCS scores respectively at 44.39 ± 2.47 (LBP group) and 47.34 ± 3.22 (NLBP group) (p=0.006) (Table 2). They also had lower mental scores with MCS scores respectively at 43.81 ± 2.18 (LBP) and 47.73 ± 2.65 (NLBP) (p=0.001). The "Physical role", "Bodily pain", "General health", "Social functioning", "Emotional role" and perceived "Mental health" were significantly poorer and lower. No differences were found in terms of "Physical functioning" and "Vitality".

After taking into account the potential confounding factors, women with low back disorders had lower physical scores with PCS scores respectively at 48.40 ± 2.37 (LBP group) and 50.75 ± 3.05 (NLBP group) (p=0.03) (Table 3). They also had lower mental scores with MCS scores respectively at 39.8 ± 2.98 (LBP group) and 43.5 ± 3.72 (NLBP group) (p=0.004). The "Physical role", "Bodily pain", "Social functioning", "Emotional role" and perceived "Mental health" were significantly poorer and lower. No differences were found in terms of "Physical functioning", "General health" and "Vitality".

	Total population % (n)	Low back pain group %(n)	No low back pain group %(n)	*P* value
Age:				
- Less than 20 years	1.8 (4)	2.2 (3)	1.2 (1)	
- 20 years to 30 years	36.9 (80)	40.2 (55)	31.3 (25)	
- 30 years to 40 years	56.7 (123)	54.0 (74)	61.2 (49)	0.47
- >40 years	4.6 (10)	3.6 (5)	6.3 (5)	
BMI (kg/m²) before pregnancy:				
- Less than to 19	10.1 (22)	7.3 (10)	14.8 (12)	
- 19 to 25	70.1 (152)	72.8 (99)	65.4 (53)	
- 25 to 30	15.2 (33)	16.2 (22)	13.6 (11)	0.25
- >30	4.6 (10)	3.7 (5)	6.2 (5)	
Term of pregnancy:				
- First Trimester (4 to 16)	4.2 (9)	2.9 (4)	6.2 (5)	
- 2nd Trimester (16 to 28)	25.8 (56)	24.8 (34)	27.5 (22)	0.42
- 3rd Trimester (>28)	70.0 (152)	72.3 (99)	66.3 (53)	
Couple:				
- Yes	90.8 (197)	88.2 (120)	95.1 (77)	0.09
- No	9.2 (20)	11.8 (16)	4.9 (4)	
Number of children:				
- No children	56.7 (123)	56.6 (77)	56.8 (46)	
- 1 children	29.0 (63)	30.9 (42)	25.9 (21)	
- 2/3 children	13.4 (29)	12.5 (17)	14.8 (12)	0.30
- >3 children	0.9 (2)	0 (0)	2.5 (2)	
Socio-professional category:				
- Managerial and professional occupations	27.5 (60)	25.6 (35)	30.9 (25)	
- Intermediary businesses, craftsmen, shopkeepers	47.7 (104)	47.5 (65)	48.2 (39)	
- Clerical support workers, service and sales workers, skilled workers	16.5 (36)	19.6 (27)	11.1 (9)	
- No job, student	8.3 (18)	7.3 (10)	9.9 (8)	0.36
Previous history of back pain outside of pregnancy:				
- Yes	32.6 (71)	45.3 (62)	11.1 (9)	
- No	67.4 (147)	54.7 (75)	88.9 (72)	<0.0001
Place of recruitment:				
- Hospital	66.5 (145)	70.1 (96)	60.5 (49)	0.15
- Primary care settings	33.5 (73)	29.8 (41)	39.5 (32)	

Table 1: Socio-demographic and medical characteristics of the population (n=218).

	Low back pain Group (n=137) Mean ± SD	No low back pain Group (n=81) Mean ± SD	*P* value
Physical Component Summary (PCS)	44.39 ± 0.65	47.34 ± 0.84	0.006
Physical Functioning (**PF**)	43.52 ± 0.87	45.21 ± 1.12	0.24
Physical Role (**RP**)	39.51 ± 0.71	44.14 ± 0.92	<0.0001
Bodily Pain (**BP**)	41.40 ± 0.79	47.37 ± 1.02	<0.0001
General Health (**GH**)	52.18 ± 0.54	54.33 ± 0.71	0.02
Mental Component Summary (MCS)	43.81 ± 0.72	47.73 ± 0.95	0.001
Vitality (**VT**)	45.19 ± 0.76	46.27 ± 0.99	0.39
Social Functioning (**SF**)	43.79 ± 0.74	48.11 ± 0.96	0.0004
Emotional Role (**RE**)	40.65 ± 0.83	43.99 ± 1.08	0.02
Mental Health (**MH**)	44.03 ± 0.74	49.41 ± 0.96	<0.0001

Table 2: Comparison of QOL between two groups (unadjusted analyses).

	Low back pain Group Mean ± SD	No low back pain Group Mean ± SD	*P* value
Physical Component Summary (PCS)	48.40 ± 1.50	50.75 ± 1.63	0.03
Physical Functioning (**PF**)	47.35 ± 2.11	48.39 ± 2.28	0.50
Physical Role (**RP**)	42.80 ± 1.69	46.80 ± 1.83	0.001
Bodily Pain (**BP**)	43.60 ± 1.91	48.41 ± 2.07	0.001
General Health (**GH**)	52.23 ± 1.35	54.06 ± 1.46	0.07
Mental Component Summary (MCS)	39.82 ± 1.75	43.54 ± 1.90	0.004
Vitality (**VT**)	41.96 ± 1.87	43.05 ± 2.03	0.43
Social Functioning (**SF**)	42.22 ± 1.84	47.00 ± 2.00	0.001
Emotional Role (**RE**)	40.19 ± 2.04	43.57 ± 2.21	0.03
Mental Health (**MH**)	41.75 ± 1.80	45.75 ± 1.95	0.003

* Analyses were adjusted for the following variables: Maternal age, term of pregnancy, family status, socio-professional category of women and low back pain history

Table 3: Comparison of QOL between two groups (adjusted analyses N=215/218).

A significant correlation between the intensity of pain and the QOL has been found for PCS and MCS (supplementary data). The more intense the pain was, the worse the perceived quality of life was, both physically and morally. The correlation coefficients for the PCS score and the MCS score were equal to ß1=-0.63 ± 0.18 and ß2=-0.83 ± 0.20, respectively. The correlation between the intensity of pain and the QOL was stronger for the mental component.

Discussion

Summary of results

In our study, the quality of life of women suffering from low back pain was poorer than that of women without low back pain. Women of the LBP group had significantly lower scores on the "Physical role", "Bodily pain", "Social Functioning", "Emotional role" and "Mental Health" sub-scales of the SF12-V2 questionnaire. Therefore, low back pain decreased physical and psychosocial health during pregnancy. In addition, few women with back pain received treatment for these low back disorders.

Strengths and limitations of the study

Few studies have assessed the impact of low back disorders during pregnancy. To the best of our knowledge, this is the first study on this topic conducted in France. In order to avoid bias related to co-morbidity, we decided to exclude women with a history of chronic diseases or hospitalized women, because their perception of the quality of life in this context of anxiety could be biased. The SF12-V2 is a commonly used tool for the assessment of the QOL of patients with low back pain.

Our study also presented limitations. This cross-sectional study does not establish a clear cause and effect relationship between QOL and low back pain, but rather an association between the presence of low back pain and an altered quality of life. Moreover, we carried out a brief exploration of the QOL. It would have been relevant to tackle other aspects of the QOL, such as the quality of sleep or sexuality, which are impaired among women suffering from back pain during pregnancy. The response rate of 69.2% in patients with and 57.9% in patients without low back pain is quite low, especially for those without back pain. Therefore, there was a risk of a certain selection bias. For example, subjects who are very interested in QOL research or those with bad QOL were more likely to participate. Furthermore, this study focused on low back pain during pregnancy and excluded patients with neck pain, shoulder pain or sacro-iliac pain. The reasons were that low back pain is a frequent reason for doctor consultation during pregnancy. Moreover, specific pathophysiological mechanisms were described for low back pain during pregnancy, including mechanical constraints, neuromuscular efficiency and fatigability of back extensor muscles, functional changes in back muscle activity, hormonal changes, psychosocial factors, etc. [7,15-17]. Moreover, we chose to recruit in hospital and primary care settings in Paris and Parisian suburb, and as such, this population is not representative of the French pregnant women population.

Comparison with others studies

In a study conducted in Sweden on pregnant women between the 34th and 37th weeks of pregnancy the QOL was significantly altered in the group suffering from back pain, with observed impact on sleep, energy, physical pain, and mobility, but also limitations in work, achievement of domestic tasks, social life and leisure [11]. In a case-control study conducted in 2009 by Coban et al. there was no clear evidence of impact of back pain on the QOL during pregnancy, though a strong correlation was found between the intensity of the pain and the physical capacity of women to perform daily tasks [12]. Mogren et al. [11] found that the perception of health was declining during pregnancy among women suffering from lumbo-pelvic pain, with an increased risk of reporting poor health (OR 3.05 [95% CI 1.70 -5.46]).

Several studies have found that pregnancy in itself contributes to a decrease in the QOL with a gradual decline in physical capacity and to emotional disorders such as anxiety and depression [18-21]. Our study found that the mental health of women suffering from back pain was perceived as poorer; they often felt depressed and discouraged. According to several authors, mental disorders such as depression, anxiety, or prenatal stress could have a short-term and long-term negative impact on women's health as well as on the children's physical and mental health [22,23]. These findings are based on the concept of "Fetal Programming", which describes how fetal or perinatal events are act on the fetus and have influence on the outbreaks of diseases upon adulthood. After birth, these antenatal psychological disorders are associated with an increased risk for the child to develop emotional problems, attention deficit disorder with hyperactivity, and impaired cognitive development [24].

Conclusion

The World Health Organization (WHO) declared that health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Positive and negative dimensions of health vary from one person to another in a continuum. Common mental health disorders include depression and anxiety and are well known to health professionals. The positive dimension of mental health includes quality of life, well-being and has recently become the central focus of international policy, such as in Canada and the United Kingdom [25].

According to the WHO, quality of life is a broad ranging concept affected by the person's physical health, psychological state, level of independence, social relationships, personal beliefs, and relationship with salient features of their environment. The results of our study support the strong association between physical, social, and psychological health. Low back pain is a common reason for consultation during pregnancy and is strongly associated with an altered quality of life among pregnant women. Well-being and quality of life of pregnant women should be included within the scope of pregnancy monitoring and preventive health programs. All health professionals involved in pregnancy care (primary health care and hospital professionals) should thus be more sensitive to the different dimensions of health.

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