

Correlation Between Sexual Function and Postrenal Transplant Quality of Life: Does Gender Matter?

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DOI: 10.1111/j.1743-6109.2007.00565.x

ABSTRACT

Introduction. Subjective health perceptions affect sexual function differently in males and females; such differences, however, have not hitherto been studied comprehensively in kidney-transplant recipients.

Aim. This study sought to investigate gender effect on the correlation between sexual function and quality-of-life (QOL) subdomains in kidney-transplant recipients by evaluating intercourse frequency (IF) and intercourse satisfaction (IS).

Methods. In a cross-sectional study, 124 married kidney-transplant recipients, who were randomly selected, were interviewed. The bivariate correlations between QOL subdomains, and IF and IS were analyzed with the Pearson test in the males and females, separately.

Main Outcome Measure. The IF and IS using the relationship and sexuality scale, and also the QOL using Short Form 36 (SF-36) were assessed.

Results. Sixty-seven subjects (54%) reported having no intercourse within the preceding months. Fifty subjects (40%) reported having no intercourse satisfaction. While IF and IS correlated with the total SF-36 score in the males ($r = 0.252$ and 0.263 , $P < 0.05$), there was no such correlation in the females. In the males, IS correlated with physical health ($r = 0.281$, $P < 0.05$) and physical function ($r = 0.274$, $P < 0.05$), and there was a correlation between IF and role limitation due to emotional problems ($r = 0.250$, $P < 0.05$). In the females, whereas IF correlated with general health ($r = 0.372$, $P < 0.05$) and mental health ($r = 0.305$, $P < 0.05$), there was no correlation between IS and QOL subdomains ($P > 0.05$).

Conclusion. Sexual function and satisfaction seem to be correlated with mental and physical health in female and male kidney-transplant recipients, respectively. Although in the two genders, both physical and mental health should be equally evaluated; improving of the sexual function may be better achieved through different approaches.

Tavallai SA, Fathi-Ashtiani A, Nasiri M, Assari S, Maleki P, and Einollahi B. Correlation between sexual function and postrenal transplant quality of life: Does gender matter? J Sex Med 2007;4:1610–1618.

Key Words. Intercourse; Frequency of Intercourse; Intercourse Satisfaction; Kidney Transplantation; Gender

Introduction

Sexual dysfunction is a common finding in both men and women with chronic kidney failure. Apart from decreased libido and fertility in both sexes, other common disturbances include erectile dysfunction in men, and menstrual abnormalities,

decreased vaginal lubrication, and sexual gratification in women [1–3].

Given the already-established correlation between decreased intercourse frequency (IF) and poorer quality of life (QOL) [4], and the fact that IF and intercourse satisfaction (IS) are compromised in kidney recipients [5–8], satisfaction and

frequency of intercourse are expected to be related to the QOL after renal transplantation. Moreover, sexual function is believed to be differently correlated with subjective health perceptions in males and females [9–10]; as a result, it is possible for such differences to exist in kidney-transplant recipients. There have been, however, no comprehensive studies thus far in the existing literature on such differences after renal transplantation.

Aim

This study sought to assess gender effect on the correlation between sexual function and QOL subdomains in kidney-transplant recipients by evaluating IF and IS.

Methods

In a cross-sectional study, 124 married kidney-transplant recipients were selected randomly from patients under follow-up in Baqiyatallah Hospital, Tehran, Iran in 2006. The inclusion criteria were stable clinical conditions, absence of any acute phase of concomitant diseases or acute infections, and a satisfactory state of kidney function (creatinine ≤ 2 mg/dl). Only those who have undergone kidney transplant between at least 6 months and at most 5 years prior to enrollment were included in the study. An informed consent was obtained from all the patients, and the patients were assured that their records would be kept confidential. The study was approved by the ethics committee of Baqiyatallah University of Medical Sciences, Tehran, Iran.

Main Outcome Measures

The subjects' IF and IS were assessed based on the relationship and sexuality scale (RSS) [11], and QOL was evaluated by means of a translated version of Short Form 36 (SF-36) [12]. SF-36 is widely used in renal recipients [13] and measures eight dimensions of health status, namely, physical functioning, social functioning, role limitations due to physical health problems, role limitations due to emotional problems, mental health, vitality, bodily pain, and general health perceptions. These eight dimensions can be summarized into the physical component summary and the mental component summary, with higher scores indicating better QOL [13]. The Persian version of SF-36 was used to ensure face validity and to maximize acceptability in the Iranian participants [14,15].

The RSS has been designed by Berglund et al. [11] and consists of 10 questions. The frequency of sexual intercourse in the preceding 2 weeks could be specified as none, once, twice, three times, four times, or more; and the IS was categorized as not at all (0%), slightly (25%), rather much (50%), much (75%), and very much (100%).

The correlations between QOL subdomains, and IF and IS were analyzed using the Pearson test in the males and females, separately. A value of $P < 0.05$ was considered significant.

Results

The 124 participants were comprised of 77 (62%) males and 47 (38%) females. Mean (standard deviation, SD) of the ages of the sample size was 42 ± 12 years: 43 ± 12 and 40 ± 12 years in the males and females, respectively. Mean time interval between transplantation and survey was 21 ± 13 months (6–33).

The mean (SD) of IS in the males and females was 43 ± 39 and 30 ± 36 , respectively. The mean (SD) of IF in the males and females was 2 ± 2 and 2 ± 2 times per month, respectively.

Thirty-seven (48%) males and 30 (64%) females reported having no intercourse within the preceding months, and 26 (34%) men and 24 (51%) women reported having no IS.

IF and IS correlated with the total SF-36 score in the males ($r = 0.252$ and 0.263 , $P < 0.05$), whereas there was no such correlation in the females. In the males, not only was there a correlation between IS and physical health ($r = 0.281$, $P < 0.05$) and between IS and physical function ($r = 0.274$, $P < 0.05$), but also there was a correlation between IF and role limitation ($r = 0.250$, $P < 0.05$). In the females, IF correlated with general health ($r = 0.372$, $P < 0.05$) and mental health ($r = 0.305$, $P < 0.05$), but IS correlated with none of the QOL subdomains ($P > 0.05$). IF or IS showed no significant correlation with time interval between transplantation and study ($P > 0.05$).

The details of the correlation coefficients between IF and IS with QOL subdomains are shown in Tables 1 and 2.

Discussion

In this study, the mean IF in all the participants was two times per month. One study has reported this rate to be two and four times per month in pre- and post-kidney transplantation phases, respectively [16]. The mean IS in all the participants was

Table 1 Correlation coefficients between IF and SF-36 subscales

Scale	IF			
	Male	Female	Total	
PF	0.168	0.129	0.167	
RPh	0.153	0.141	0.146	
BP	-0.064	-0.316*	-0.174	
SF	0.076	0.098	0.070	
MH	0.096	-0.328*	-0.033	
Quality of life	REm	0.50*	-0.055	0.142
	VT	0.015	0.022	0.019
	GH	0.110	-0.372*	-0.082
	PCS	0.220	0.012	0.140
	MCS	0.244	-0.305**	0.059
	SF-36 Total	0.252*	-0.015	0.156

* $P < 0.05$; ** $P < 0.01$.

IF = intercourse frequency; SF-36 = Short Form 36; PF = physical functioning; RPh = role limitations due to physical health problems; BP = bodily pain; SF = social functioning; MH = mental health; REm = role limitations due to emotional problems; VT = vitality; GH = general health; PCS = physical composite score; MCS = mental composite score.

38%, as compared with a previously reported mean IS at pre- and post-kidney transplantation of 35% and 62%, respectively [17]. Another study puts mean IS at 64%, both pre- and post-kidney transplantation [18]. The mean IS in our study, therefore, was less than we had expected.

Whereas IF and IS correlated with the total SF-36 score among the males, there was no such correlation in the female subjects. An association between QOL and sexual function, albeit not just in males, has been previously reported in the general population [10].

A test of correlations in our series between the subdomains of QOL, and IS and IF revealed that whereas in males, IF and IS correlated with QOL;

Table 2 Correlation coefficients between IF and IS and SF-36 subscales

Scale	IS			
	Male	Female	Total	
PF	0.274**	0.009	0.192**	
RPh	0.097	-0.004	0.054	
BP	0.068	-0.270	-0.080	
SF	-0.119	0.168	-0.036	
MH	0.111	-0.220	0.020	
Quality of life	REm	0.154	0.060	0.136
	VT	-0.034	-0.139	-0.077
	GH	0.002	-0.198	-0.078
	PCS	0.281*	-0.104	0.135
	MCS	0.073	-0.134	0.014
	SF-36 Total	0.263*	-0.086	0.145

* $P < 0.05$; ** $P < 0.01$.

IF = intercourse frequency; IS = intercourse satisfaction; SF-36 = Short Form 36; PF = physical functioning; RPh = role limitations due to physical health problems; BP = bodily pain; SF = social functioning; MH = mental health; REm = role limitations due to emotional problems; VT = vitality; GH = general health; PCS = physical composite score; MCS = mental composite score.

in females, IF—and not IS—correlated with QOL. In contrast to our results, one study reported that a significant correlation exists for women only, between the degree of general life satisfaction and sexual satisfaction [19]. In 2005, Lau et al. [10], in a population-based study with a large sample size in the Chinese population, reported that women's mental health, unlike their male counterparts, is associated with all kinds of sexual problems including lack of sexual pleasure, inability to have an orgasm, lack of interest in sex, feeling of anxiety, pain, and problem with lubrication. The authors of the said study concluded that sexual problems seem to be more consequential to women than to men.

The different patterns of correlation of IF and IS with QOL subdomains among the males and females in our series highlight a gender-dependent pattern of interaction between sexual function and well-being. Lau et al. [10] reported similar results, having arrived at the conclusion that women's sexual problems are more affected by their mental health status in comparison to men.

In our study, sexual satisfaction was, therefore, a determinant of low QOL in the males, in whom sexual satisfaction tended to be affected by the physical components of health. On the contrary, in our female subjects, sexual dysfunction correlated with poor mental health.

In the existing literature, such evidence as stronger associations between sexual problems and physical health among men [9], correlations of physical activity with sexual function in men [20], and weaker correlations between sexual activities and physical health compared to psychosocial factors in females could all be cited in support of our findings [21]. Nonetheless, our findings do not tally with previously reported associations between sexual problems and mental health [10], and correlations of sexual dysfunction with poor physical health in both sexes [22].

Different studies, notwithstanding their important differences, report a gender-dependent pattern of interaction between sexual function and QOL subdomains, which may be due to the differences in physiological and behavioral aspects of sexual function in the two sexes, or the effect of sexual function-related variables in the two genders. For example, it has been reported that women are significantly less interested in sex and less likely to regard sex as being important [10]. The gender impact on the experience of emotions, the degree of self-control [23], and the intensity of feeling emotions [24] may also partly justify these differences. The well-known gender difference in

coping strategies when dealing with problems may be a reason. Further studies are required to verify these assumptions, however.

Given the association between sexual problems (either low IF or low IS) and low QOL, the treatment of sexual dysfunction seems to be beneficial in kidney recipients. Some drugs have proved efficacious in improving sexual performance following kidney transplantation. Drugs such as phosphodiesterase type 5 inhibitors [25–26], calcineurin [27], papaverine, phentolamine, prostaglandin E₁ (PGE₁), and a combination of these drugs [8] have all demonstrated safety and efficacy in kidney recipients.

Previous studies have assessed the impact of sexual dysfunction on QOL [10] and life satisfaction [28] by primarily focusing to only one gender. We, therefore, sought to study the difference of this impact between the two genders [29]. It is deserving of note that there are already some interests toward formulating unified diagnostic and treatment approaches to sexual problems in men and women; our results regarding different correlates of sexual problems in the two genders suggest that different aspects of life quality should be taken into account in providing care to males and females with sexual dysfunctions [30].

The decrease in IF and IS per se may not be assumed as poor sexuality [31], but we believe that it can provide data regarding the quality of sexual functioning. Lower frequency of intercourse has been used as an indicator of sexual life disturbance previously [32]. Moreover, IF is reported to be associated with satisfaction with sexual life [33], and is usually decreased among subjects suffering with some kinds of sexual dysfunction [34].

Our study has several limitations; not only does it fail to measure sexual function in sexual partners, for example, an impotent partner, but it also omits to measure several variables with an impact on QOL and sexual function, and satisfaction with sexual functioning. These include culture, race, religion, [35–37] interpersonal relations, personality and psychological characteristics [38–40], physical [41] and mental health [42], presence or absence of sexual dysfunction in their spouses, marital relationship, socioeconomic status (e.g., employment), sexual knowledge, and clinical variables related to the severity of the disease [43].

Conclusion

Our results show that IF is correlated with mental health in female, and IS is correlated with physical

health in male kidney-transplant recipients. Although our results may not be able to prove a causative relation, one can safely assume that sexual function can be improved via different approaches in male and female kidney-transplant recipients. However, none of the physical and mental aspects of health in males and females with sexual problems should be disregarded.

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Conflict of Interest: None declared.

References

- 1 Paskircioglu L, Tekin MI, Demirag A, Karakayali H, Ozkardes H. Evaluation of erectile function in renal transplant recipients. *Transplant Proc* 1998; 30:747–9.
- 2 Palmer BF. Sexual dysfunction in men and women with chronic kidney disease and end-stage kidney disease. *Adv Ren Replace Ther* 2003;10:48–60.
- 3 Guan J, Fan JM, Zhang WD, Luo H, Li Z, Peng GH, Zhou L, Wang W. Sexual dysfunction in female patients with chronic renal insufficiency. *Sichuan Da Xue Xue Bao Yi Xue Ban* 2005;36:555–8.
- 4 Steele TE, Wuerth D, Finkelstein S, Juergensen D, Juergensen P, Kliger AS, Finkelstein FO. Sexual experience of the chronic peritoneal dialysis patient. *J Am Soc Nephrol* 1996;7:1165–8.
- 5 Malavaud B, Rostaing L, Rischmann P, Sarramon JP, Durand D. High prevalence of erectile dysfunction after renal transplantation. *Transplantation* 2000;69:2121–4.
- 6 Tsujimura A, Matsumiya K, Tsuboniwa N, Yamanaka M, Miura H, Kitamura M, Kishikawa H, Nishimura K, Ichikawa Y, Nagano S, Kokado Y, Takahara S, Okuyama A. Effect of renal transplantation on sexual function. *Arch Androl* 2002;48:467–74.
- 7 Espinoza R, Gracida C, Cancino J, Ibarra A. Prevalence of erectile dysfunction in kidney transplant recipients. *Transplant Proc* 2006;38:916–7.
- 8 Lasaponara F, Paradiso M, Milan MGL, Morabito F, Sedigh O, Graziano ME, Abbona A, Piccoli GB, Rossetti M, Mezza E, Ferrando U. Dysfunction after kidney transplantation: Our 22 years of experience. *Transplant Proc* 2004;36:502–4.
- 9 Laumann EO, Nicolosi A, Glasser DB, Paik A, Gingell C, Moreira E, Wang T. Sexual problems among women and men aged 40–80 y: Prevalence and correlates identified in the Global Study of Sexual Attitudes and Behaviors. *Int J Impot Res* 2005;17:39–57.
- 10 Lau JT, Kim JH, Tsui HY. Prevalence of male and female sexual problems, perceptions related to sex

- and association with quality of life in a Chinese population: A population-based study. *Int J Impot Res* 2005;17:494–505.
- 11 Berglund G, Nystedt M, Bolund C, Sjoden PO, Rutquist LE. Effect of endocrine treatment on sexuality in premenopausal breast cancer patients: A prospective randomized study. *J Clin Oncol* 2001; 19:2788–96.
 - 12 Ware JR, Kosinsky M, Keller SD. SF-36 physical and mental health summary scores: A user's manual. Boston, MA: The Health Institute, New England Medical Center; 1994.
 - 13 Edgell ET, Coons SJ, Carter WB, Kallich JD, Mapes D, Damush TM, Hays RD. A review of health-related quality-of-life measures in end-stage renal disease. *Clin Ther* 1996;18:887–938.
 - 14 Zargooshi J. Quality of life of Iranian kidney donors. *J Urol* 2001;166:1790–9.
 - 15 Montazeri A, Goshtasebi A, Vahdaninia M, Gandek B. The Short Form Health Survey (SF-36): Translation and validation study of the Iranian version. *Qual Life Res* 2005;14:875–82.
 - 16 Burgos FJ, Pascual J, Gomez V, Orofino L, Liano F, Ortuno J. Effect of kidney transplantation and cyclosporine treatment on male sexual performance and hormonal profile: A prospective study. *Transplant Proc* 1997;29:227–8.
 - 17 Barrou B, Cuzin B, Malavaud B, Petit J, Pariente JL, Buchler M, Cormier L, Benoit G, Costa P. Early experience with sildenafil for the treatment of erectile dysfunction in renal transplant recipients. *Nephrol Dial Transplant* 2003;18:411–7.
 - 18 El-Bahnasawy MS, El-Assmy A, Dawood A, Abobieh E, Dein BA, El-Din AB, El-Hemady Sel-D. Effect of the use of internal iliac artery for renal transplantation on penile vascularity and erectile function: A prospective study. *J Urol* 2004;172:2335–9.
 - 19 Walfisch S, Maoz B, Antonovsky H. Sexual satisfaction among middle-aged couples: Correlation with frequency of intercourse and health status. *Maturitas* 1984;6:285–96.
 - 20 Moreira ED Jr, Kim SC, Glasser D, Gingell C. Sexual activity, prevalence of sexual problems, and associated help-seeking patterns in men and women aged 40–80 years in Korea: Data from the Global Study of Sexual Attitudes and Behaviors (GSSAB). *J Sex Med* 2006;3:201–11.
 - 21 Avis NE. Sexual function and aging in men and women: Community and population-based studies. *J Gend Specif Med* 2000;3:37–41.
 - 22 Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States: Prevalence and predictors. *JAMA* 1999;281:537–44.
 - 23 Daniluk JC. Essential skills for working with infertile clients. American Psychological Association Annual Convention (Continuing Education Workshop #116), Boston, MA; 1999.
 - 24 Goldberg D. Manual of the general health questionnaire. UK: NFER Nelson; Windsor, UK: 1978.
 - 25 Espinoza R, Gracida C, Cancino J, Ibarra A. Prevalence of erectile dysfunction in kidney transplant recipients. *Transplant Proc* 2006;38:916–7.
 - 26 Espinoza R, Melchor JL, Gracida C. Sildenafil (Viagra) in kidney transplant recipients with erectile dysfunction. *Transplant Proc* 2002;34:408–9.
 - 27 Kantarci G, Sahin S, Uras AR, Ergin H. Effects of different calcineurin inhibitors on sex hormone levels in transplanted male patients. *Transplant Proc* 2004;36:178–9.
 - 28 Mallis D, Moisidis K, Kirana PS, Papaharitou S, Simos G, Hatzichristou D. Moderate and severe erectile dysfunction equally affects life satisfaction. *J Sex Med* 2006;3:442–9.
 - 29 Heinemann LA, Potthoff P, Heinemann K, Pauls A, Ahlers CJ, Saad F. Scale for Quality of Sexual Function (QSF) as an outcome measure for both genders? *J Sex Med* 2005;2:82–95.
 - 30 Hatzichristou D, Rosen RC, Broderick G, Clayton A, Cuzin B, Derogatis L, Litwin M, Meuleman E, O'Leary M, Quirk F, Sadovsky R, Seftel A. Clinical evaluation and management strategy for sexual dysfunction in men and women. *J Sex Med* 2004;1:49–57.
 - 31 Hatzimouratidis K, Hatzichristou D. Sexual dysfunctions: Classifications and definitions. *J Sex Med* 2007;4:241–50.
 - 32 Koskimaki J, Hakama M, Huhtala H, Tammela TL. Effect of erectile dysfunction on frequency of intercourse: A population based prevalence study in Finland. *J Urol* 2000;164:367–70.
 - 33 Riley A, Beardsworth A, Kontodimas S, Suarez D, Torres JV, Haro JM. Sexual intercourse frequency in men presenting for treatment of erectile dysfunction: Results from the pan-European erectile dysfunction observational study. *J Sex Marital Ther* 2007;33:3–18.
 - 34 Chen KK, Chiang HS, Jiann BP, Lin JS, Liu WJ, Wu CJ, Hsieh JT, Wang CJ, Hwang TI, Lee SS. Prevalence of erectile dysfunction and impacts on sexual activity and self-reported intercourse satisfaction in men older than 40 years in Taiwan. *Int J Impot Res* 2004;16:249–55.
 - 35 Brotto LA, Woo JS, Ryder AG. Acculturation and sexual function in Canadian East Asian Men. *J Sex Med* 2007;4:72–82.
 - 36 Richardson D, Goldmeier D. Premature ejaculation—Does country of origin tell us anything about etiology? *J Sex Med* 2005;2:508–12.
 - 37 Richardson D, Wood K, Goldmeier D. A qualitative pilot study of islamic men with lifelong premature (rapid) ejaculation. *J Sex Med* 2006;3:337–43.
 - 38 Althof S. The psychology of premature ejaculation: Therapies and consequences. *J Sex Med* 2006;3(4 suppl):324–31.
 - 39 Latini DM, Penson DF, Wallace KL, Lubeck DP, Lue TF. Clinical and psychosocial characteristics of men with erectile dysfunction: Baseline data from ExCEED. *J Sex Med* 2006;3:1059–67.

40 Dean J, Hackett GI, Gentile V, Pirozzi-Farina F, Rosen RC, Zhao Y, Warner MR, Beardsworth A. Psychosocial outcomes and drug attributes affecting treatment choice in men receiving sildenafil citrate and tadalafil for the treatment of erectile dysfunction: Results of a multicenter, randomized, open-label, crossover study. *J Sex Med* 2006;3: 650–61.

41 Laumann EO, West S, Glasser D, Carson C, Rosen R, Kang JH. Prevalence and correlates of erectile dysfunction by race and ethnicity among men aged 40 or older in the United States: From the male attitudes regarding sexual health survey. *J Sex Med* 2007;4:57–65.

42 Basson R, Brotto LA, Laan E, Redmond G, Utian WH. Assessment and management of women’s sexual dysfunctions: Problematic desire and arousal. *J Sex Med* 2005;2:291–300.

43 Barsky JL, Friedman MA, Rosen RC. Sexual dysfunction and chronic illness: The role of flexibility in coping. *J Sex Marital Ther* 2006;32:235–53.

Appendix

Relationship and Sexuality Scale

Negative effect of disease on sexual life	Not at all	Slightly	Rather much	Much	Very much
Effect of disease on sexual desire	Increased	No change	Decreased	All gone	
Effect of treatment on sexual desire	Increased	No change	Decreased	All gone	
Satisfaction with frequency of hugs and kisses	Not at all	Slightly	Rather much	Much	Very much
Fear of sexual intercourse	Never	Rarely	Sometimes	Often	Always
Perceived fear of partner for sexual intercourse	Never	Rarely	Sometimes	Often	Always
Frequency of sexual intercourse relative to level before disease diagnosed	Increased a lot	Somewhat increased	No change	Somewhat decreased	
Ability to reach orgasm relative to that before disease diagnosed	Increased a lot	Somewhat increased	No change	Somewhat decreased	
Satisfaction with your intercourse	Not at all	Slightly	Rather much	Much	Very much
Frequency of sexual intercourse in the last 2 weeks	None	Once	Twice	Three times	Four or more

SF-36

Please answer the following questions about your health. Select **ONLY ONE ANSWER** for each question.

1. In general, would you say your health is:
 1. Excellent
 2. Very Good
 3. Good
 4. Fair
 5. Poor

2. Compared to one year ago, how would you rate your health in general now?
 1. Much better now than one year ago
 2. Somewhat better now than one year ago
 3. About the same as one year ago
 4. Somewhat worse now than one year ago
 5. Much worse than one year ago

3. Does your health now limit you in this activity? If so, how much? Vigorous activities, such as running, lifting heavy objects, participating in strenuous sports.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all

The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

4. Does your health now limit you in this activity? If so, how much? Moderate activities, such as moving a table, pushing a vacuum cleaner, bowling or playing golf.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all

5. Does your health now limit you in this activity? If so, how much? Lifting or carrying groceries.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all
6. Does your health now limit you in this activity? If so, how much? Climbing several flights of stairs.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all
7. Does your health now limit you in this activity? If so, how much? Climbing one flight of stairs.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all
8. Does your health now limit you in this activity? If so, how much? Bending, kneeling, or stooping.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all
9. Does your health now limit you in this activity? If so, how much? Walking more than a mile.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all
10. Does your health now limit you in this activity? If so, how much? Walking several blocks.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all
11. Does your health now limit you in this activity? If so, how much? Walking one block.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all
12. Does your health now limit you in this activity? If so, how much? Bathing or dressing yourself.
 1. Yes, limited a lot
 2. Yes, limited a little
 3. No, not limited at all
13. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of your physical health? Cut down the amount of time you spent on work or other activities.
 1. Yes
 2. No
14. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of your physical health? Accomplished less than you would like.
 1. Yes
 2. No
15. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of your physical health? Were limited in the kind of work or other activities.
 1. Yes
 2. No
16. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of your physical health? Had difficulty performing the work or other activities (for example, it took extra effort).
 1. Yes
 2. No

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of any EMOTIONAL PROBLEMS (such as feeling depressed or anxious)?

17. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? Cut down the amount of time you spent on work or other activities.
 1. Yes
 2. No
18. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? Accomplished less than you would like.
 1. Yes
 2. No

During the past 4 weeks, have you had any of the following problems with your work or other regular daily activities as a result of your PHYSICAL HEALTH?

19. During the past 4 weeks, have you had the following problem with your work or other regular daily activities as a result of any emotional problems (such as feeling depressed or anxious)? Didn't do work or other activities as carefully as usual.
1. Yes
 2. No
20. During the past 4 weeks, to what extent has your physical health OR emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?
1. Not at all
 2. Slightly
 3. Moderately
 4. Quite a bit
 5. Extremely
21. How much bodily pain have you had during the past 4 weeks?
1. None
 2. Very mild
 3. Mild
 4. Moderate
 5. Severe
 6. Very severe
22. During the past 4 weeks how much did pain interfere with your normal work (including both work outside the home and housework)?
1. Not at all
 2. A little bit
 3. Moderately
 4. Quite a bit
 5. Extremely
- These questions are about how you feel and how things have been with you during the past 4 weeks. For each question, please give the one answer that comes closest to the way you have been feeling.
23. How much of the time during the past 4 weeks:
- Did you feel full of pep?
1. All of the time
 2. Most of the time
 3. A good bit of the time
 4. Some of the time
 5. A little of the time
 6. None of the time
24. How much of the time during the past 4 weeks:
- Have you been a very nervous person?
1. All of the time
 2. Most of the time
 3. A good bit of the time
 4. Some of the time
 5. A little of the time
 6. None of the time
25. How much of the time during the past 4 weeks:
- Have you felt so down in the dumps that nothing could cheer you up?
1. All of the time
 2. Most of the time
 3. A good bit of the time
 4. Some of the time
 5. A little of the time
 6. None of the time
26. How much of the time during the past 4 weeks:
- Have you felt calm and peaceful?
1. All of the time
 2. Most of the time
 3. A good bit of the time
 4. Some of the time
 5. A little of the time
 6. None of the time
27. How much of the time during the past 4 weeks:
- Did you have a lot of energy?
1. All of the time
 2. Most of the time
 3. A good bit of the time
 4. Some of the time
 5. A little of the time
 6. None of the time
28. How much of the time during the past 4 weeks:
- Have you felt downhearted and blue?
1. All of the time
 2. Most of the time
 3. A good bit of the time
 4. Some of the time
 5. A little of the time
 6. None of the time
29. How much of the time during the past 4 weeks:
- Did you feel worn out?
1. All of the time
 2. Most of the time
 3. A good bit of the time
 4. Some of the time
 5. A little of the time
 6. None of the time

30. How much of the time during the past 4 weeks:
Have you been a happy person?
1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. None of the time
31. How much of the time during the past 4 weeks:
Did you feel tired?
1. All of the time
2. Most of the time
3. A good bit of the time
4. Some of the time
5. A little of the time
6. None of the time
32. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?
1. All of the time
2. Most of the time
3. Some of the time
4. A little of the time
5. None of the time
33. How true or false is the following statement? I seem to get sick a little easier than other people.
1. Definitely true
2. Mostly true
3. Don't know
34. How true or false is the following statement? I am as healthy as anybody I know.
1. Definitely true
2. Mostly true
3. Don't know
4. Mostly false
5. Definitely false
35. How true or false is the following statement? I expect my health to get worse.
1. Definitely true
2. Mostly true
3. Don't know
4. Mostly false
5. Definitely false
36. How true or false is the following statement? My health is excellent.
1. Definitely true
2. Mostly true
3. Don't know
4. Mostly false
5. Definitely false
37. Are you . . . ?
1. Male
2. Female
38. How old were you on your last birthday?
1. Less than 24
2. 25–34
3. 35–44
4. 45–54
5. 55–64
6. 65 & Over