David H. Wilson[1], **Catherine R. Chittleborough**[2], **Kerry Kirke**[3], **Janet F. Grant**[2], **Richard E. Ruffin**[1]

[1] *The Health Observatory, University of Adelaide*

[2] *Population Research and Outcome Studies Unit, Department of Human Services, Adelaide*

[3] *Cancer Council of South Australia, Adelaide*

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The health-related quality of life of male and female heavy smokers

Summary

Objectives: Heavy smokers are a segment of the smoking population who are at increased risk of smoking-related morbidity and least likely to achieve cessation. This study identifies the impact of heavy smoking on quality of life by gender and describes the subpopulation for improved targeting.

Methods: South Australian representative population data (n = 3 010) was used to compare the health-related quality of life status of male and female heavy smokers as assessed by the SF-36.

Results: Of the smoking population 18 % were classified as heavy smokers. There was a clear dose response relationship between amount smoked and deteriorating quality of life for all female smokers. Female heavy smokers were found to be significantly more impaired on all health-related quality of life dimensions, when compared to male heavy smokers.

Conclusions: The association of smoking with impaired quality of life is more marked in females than in males. There is a need to identify female smokers as a distinct target group in smoking cessation initiatives and programs.

Keywords: **Smoking – Health-related quality of life – Heavy smokers – Gender.**

The smoking population is not homogenous (Wilson et al. 1995), and heavy smokers are more at risk from adverse effects of smoking than light smokers (Doll et al. 1994). Heavy smokers, when compared with light smokers, have been shown to be more likely to be male, to be thirty years of age or older, to be unemployed, to be more heavily addicted and to have less confidence in their ability to quit smoking (Wilson et al. 1992a). These variations between heavy and lighter smokers have suggested differences in policy needs and strategic intervention methods for the heavy smoking segment within the smoking population. It has also been recognised that smokers cannot be treated as a homogenous group given that significant differences in health-related quality of life scores exist between light, moderate and heavy smokers (Wilson et al. 1999). A dose-response relationship between smoking and health-related quality of life was identified in this previous study, with heavier smoking associated with lower health-related quality of life scores. It was argued that if attempts at total cessation are unsuccessful, heavy smokers should be encouraged to become light smokers given the advantages of improved health-related quality of life with lighter smoking. This previous study, however, did not assess the gender differences in quality of life or differences in the characteristics of male and female smokers at various levels of smoking behaviour, which may further refine targeting strategies to achieve smoking cessation. Information about the impact of smoking and smoking cessation on health-related quality of life may also be important in encouraging smokers to quit (Mulder et al. 2001).

The present study compares the health-related quality of life of males and females in a representative population sample of South Australian light, moderate and heavy smokers and examines the differences in quality of life and other characteristics between these sub-populations.

Methods

The South Australian Health Omnibus Survey was used to collect information on smoking and health-related quality of life in 1998. This representative population survey of adults aged 15 years or older involved a multistage, systematic, clustered area sample of people living in metropolitan Adelaide and country centres with a population of over 1000 persons. Hotels, motels, hospitals, nursing homes and other institutions were excluded. The person whose birthday was next in the selected household was interviewed in their home by trained health interviewers. There was no

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replacement for non-respondents. Up to six callbacks were made in an attempt to interview the selected person, resulting in 3010 interviews being conducted (response rate 70%).

The sample for the Health Omnibus Survey was obtained by selecting a random sample of Australian Bureau of Statistics collector districts. Within each collector district a random starting point was selected and from this point 10 households were then selected in a given direction with a fixed skip interval. The data, because they come from a large clustered sample, were then weighted by age, sex, geographic region and possibility of selection in the household, to estimated resident population data so that the results were representative of the South Australian population. This survey method has been previously reported and used to compare health-related quality of life status for different categories of smokers (Wilson et al. 1992b; 1999).

A heavy smoker was defined as a person smoking 25 or more cigarettes per day, based on criteria of the US Surgeon General (US Department of Health and Human Services 1989). Moderate smokers were classified as smoking 15 to 24 cigarettes per day, and light smokers as less than 15 cigarettes per day. Questions asking whether cigarette consumption varied between working and leisure days, the number of cigarettes smoked on a working day and a leisure day, and the number of days worked per week were used to derive the number of cigarettes smoked.

The short form (SF-36) health-related quality of life questionnaire, which has been validated for Australia using the scoring method of the Medical Outcomes Trust (McCallum 1994), was also administered to participants. The eight subscales of the SF-36 are physical functioning (PF), role-physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role-emotional (RE), and mental health (MH).

The Health Omnibus Survey also included demographic questions on gender, age, marital status, country of birth, area of residence, employment status, income, level of education, and socio-economic status. Area of residence was derived from Australian Bureau of Statistics Collector Districts based on regional divisions of South Australia. Socio-economic status was derived from occupational status as determined from the Australian Standard Classification of Occupations codes (Australian Bureau of Statistics 1990), and aggregated into the conventional categories of high, medium and low socio-economic status (Kelley & Evans 1988). Participants were also asked the age at which they started smoking, whether they had medically confirmed asthma, bronchitis, emphysema, or diabetes.

Data analysis

Data were analysed using SPSS for Windows Version 10.0 (1999) and EpiInfo (Dean et al. 1994). Multiple linear regression, adjusting for age and socio-economic status, was used to compute mean scores for each dimension of the SF-36 for male and female light, moderate and heavy smokers. Mean scores among male and female smokers were compared using *t*-tests. Standard health-related quality of life scores were calculated for male, female and all smokers using the method of Garratt et al. (1993). Standard scores were calculated for each SF-36 dimension by dividing the differences between the health-related quality of life scores for male and female heavy smokers and all smokers, respectively, and the norm of the general population by the standard deviation of the general population. The standard score for the general population was set at zero. According to Kazis et al. (1989), the interpretation of differences in standard scores is such that an effect size of 0.2, or one fifth of a standard deviation, is described as small, an effect size of 0.5 as moderate, and an effect size of 0.8 as large. Univariate analyses compared male and female smokers on a range of demographic and health-related variables.

Results

The prevalence of smoking was 24.3% (95% CI 22.8–26.0), with 4.3% (n = 131, 95% CI 3.6–5.2) of the sample classified as heavy smokers. Of the smoking population (n = 733), 17.9% (95% CI 15.1–21.0) were classified as heavy smokers, 25.4% (95% CI 22.1–28.9) as moderate and 56.8% (95% CI 52.9–60.5) as light smokers. Of the overall smoking population (n = 733), 46.4% (95% CI 42.6–50.3) were female, and the mean age was 37.6 years (SD 14.6). Of the heavy smoking population (n = 131), 33.2% (95% CI 24.7–42.1) were female, and the mean age was 41.7 years (SD 13.3).

Table 1 reports the mean SF-36 dimension scores for all smokers and heavy smokers, by gender. SF-36 standardised scores for all male and female smokers are shown in Figure 1. Female smokers fell below male smokers on every dimension of the SF-36 and these differences were statistically significant on six of the eight dimensions ($p < 0.05$). The differences between male smokers and female smokers were not statistically significant for BP or GH. Figure 2 shows the differences in SF-36 scores for each level of smoking and it can be seen that both moderate and light female smokers also fell below male heavy smokers on every dimension indicating greater impairment. Female heavy smokers scored significantly lower than male heavy smokers on all dimensions of the SF-36 with the exception of the GH dimension, which

Table 1 Mean SF-36 scores (95 % CI) for male and female heavy, and all smokers, controlled for age and socio-economic status

SF-36 Dimension	Males	Females	p value
All smokers	n = 393	n = 340	
Physical functioning	86.2 (82.8–90.1)	81.1 (67.2–78.7)	< 0.001
Role-physical	82.2 (76.1–89.9)	75.5 (53.9–75.6)	0.01
Bodily pain	71.0 (67.5–76.2)	69.1 (51.6–64.6)	0.2
General health	70.7 (62.8–71.4)	70.3 (55.5–68.0)	0.8
Vitality	66.7 (59.4–67.6)	58.9 (41.2–53.4)	< 0.001
Social functioning	87.7 (84.6–93.3)	83.1 (68.6–81.7)	0.005
Role-emotional	89.5 (84.7–95.7)	79.5 (61.8–80.5)	< 0.001
Mental health	80.8 (73.5–80.3)	75.1 (58.3–68.6)	< 0.001
Heavy smokers	n = 87	n = 43	
Physical functioning	86.4 (82.8–90.1)	73.0 (67.2–78.7)	< 0.001
Role-physical	83.0 (76.1–89.9)	64.7 (53.9–75.6)	0.005
Bodily pain	71.9 (67.5–76.2)	58.1 (51.6–64.6)	< 0.001
General health	67.1 (62.8–71.4)	61.8 (55.5–68.0)	0.2
Vitality	63.5 (59.4–67.6)	47.3 (41.2–53.4)	< 0.001
Social functioning	89.0 (84.6–93.3)	75.2 (68.6–81.7)	< 0.001
Role-emotional	90.2 (84.7–95.7)	71.2 (61.8–80.5)	< 0.001
Mental health	76.9 (73.5–80.3)	63.4 (58.3–68.6)	< 0.001

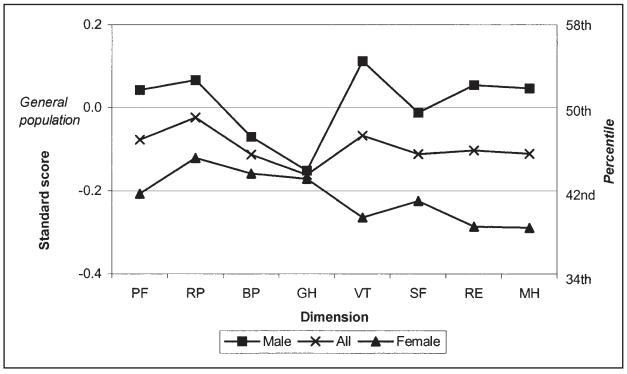

Figure 1 SF-36 standard scores for male, female and all smokers, compared to the general population, controlled for age and socio-economic status

did not reach statistical significance. Female heavy smokers fell in the bottom 34% of the population on all dimensions, reaching as low as the 16th percentile of the population, which is regarded as a large effect (Kazis et al. 1989), on the MH dimension. The GH dimension was the lowest scoring dimension for male heavy smokers but was only as low as the 36th percentile.

Although the difference in quality of life between female and male smokers becomes less severe for lighter smokers, female light smokers were still significantly more impaired than male light smokers on two quality of life dimensions, VT and RE (Fig. 2).

Univariate analyses of the data in Table 2 showed that there was a statistically significantly higher proportion of respondents who were separated, divorced or widowed; unemployed, retired, a student, or undertaking home duties; had no post school education; of high socio-economic status as derived from occupation; were underweight or did not report their height or weight; had asthma or bronchitis; and who started smoking at 21 years of age or later, among female smokers than male smokers. Among heavy smokers there was a statistically significantly higher proportion of females than males who were separated, divorced or widowed; were unemployed, retired, a student, or undertaking home duties; of high socio-economic status as derived from occupation; and had bronchitis (Tab. 2).

Discussion

This study found that the health-related quality of life of female heavy smokers is significantly impaired when compared to male heavy smokers. The lower health-related quality of life scores for all female smokers is not explained by the generally lower quality of life scores reported in other studies among all women (Linzer et al. 1996; Macintyre et al. 1996). Supplementary analyses of our data provided significantly lower quality of life estimates for the total female population compared to the male population for all SF-36 subscales with the exception of GH. Further analyses also showed that female smokers scored significantly lower on all subscales,

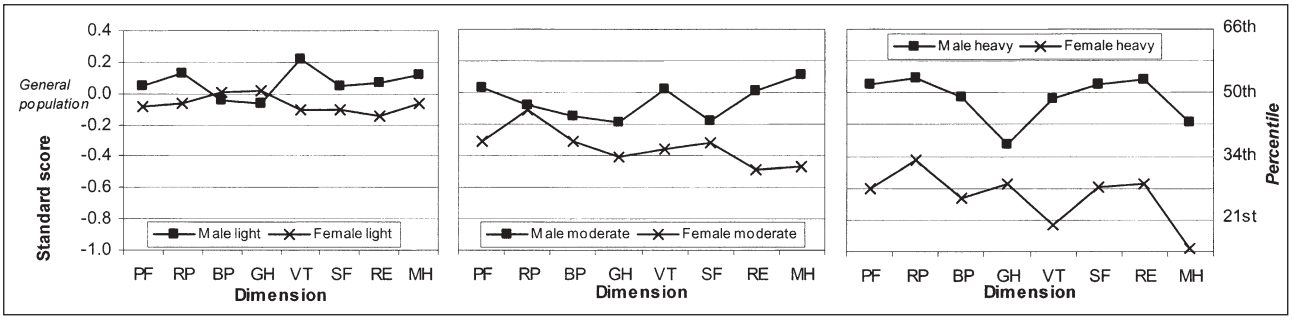

Figure 2 SF-36 standard scores for female and male smokers by level of smoking (heavy, moderate and light), compared to the general population, controlled for age and socio-economic status

Table 2 Distribution of demographic and health-related variables among male and female smokers

		All smokers		Heavy smokers	
		Males (n = 393) %	Females (n = 340) %	Males (n = 87) %	Females (n = 43) %
Age (years)	15–34	46.4	50.8	42.4	24.5
	35–54	39.5	35.7	38.6	56.6
	55+	14.1	13.4	18.9	19.0
Country of birth	Australia	80.3	79.8	76.9	64.4
	UK & Ireland	9.2	12.1	11.3	17.6
	Other	10.5	8.1	11.8	18.0
Area of residence	Metropolitan	66.6	66.4	53.6	64.4
	Country	33.4	33.6	46.4	35.6
Marital status	Married	56.8	53.7	63.9	42.6 ↓
	Separated/divorced/widowed	10.3	18.2 ↑	13.2	41.0 ↑
	Never married	32.9	28.1	22.9	16.4
Work status	Employed	67.5	56.1 ↓	62.1	39.6 ↓
	Unemployed/home duties/ retired/student/other	32.5	43.9 ↑	37.9	60.4 ↑
Income	$20000 or less	27.3	27.8	42.0	40.9
	More than $20000	72.7	72.2	58.0	59.1
Education	No post school education	51.4	64.3 ↑	65.7	60.0
	Post school education	48.6	35.7 ↓	34.3	40.0
Socio-economic status	Low	38.2	38.1	41.2	41.5
	Medium	38.1	14.9 ↓	39.5	13.8 ↓
	High	23.7	46.9 ↑	19.2	44.8 ↑
BMI	Underweight	6.4	15.8 ↑	7.1	13.0
	Normal	42.4	37.3	34.7	25.2
	Overweight	29.4	20.4 ↓	32.7	22.9
	Obese	17.3	12.9	19.7	27.9
	Not stated	4.4	13.5 ↑	5.9	11.1
Asthma	No asthma	92.9	85.8 ↓	94.5	89.1
	Asthma	7.1	14.2 ↑	5.5	10.9
Bronchitis	No bronchitis	86.4	75.4 ↓	86.3	69.4 ↓
	Bronchitis	13.6	24.6 ↑	13.7	30.6 ↑
Emphysema	No emphysema	99.1	99.3	97.2	97.8
	Emphysema	0.9	0.7	2.8	2.2
Diabetes	No diabetes	97.4	96.6	92.4	91.9
	Diabetes	2.6	3.4	7.6	8.1
Age started smoking (years)	12 or younger	8.7	4.9	14.6	11.8
	13–16	46.1	45.4	56.5	51.0
	17–20	34.2	31.8	20.1	25.8
	21+	11.0	17.9 ↑	8.7	11.5
Total		100.0	100.0	100.0	100.0

↑ ↓ Statistically significantly higher or lower proportion among females than males ($p < 0.05$)

with the exception of RP, when compared to female non-smokers. There is clearly a relationship between quality of life and smoking and the effect of smoking on quality of life is a particular burden for females. Furthermore, the heavier the smoking the lower the quality of life scores for both males and females. Again, it is not possible to categorically state the direction of this association, although there is probably enough evidence from other studies to suggest impaired quality of life is a result of smoking rather than people with impaired quality of life being more likely to smoke (Prescott et al. 1997; Holman & Shean 1986). Prescott et al. (1998) also showed that the impact of smoking on women was greater for those with respiratory and vascular disease. The case for a special effort on female smoking cessation is now clear.

A case has been made previously for targeting all heavy smokers (Wilson et al. 1999) but there is an additional case for specific targeting of female smokers given their worsened quality of life status in the present study. This, as other studies have shown, is an important impairment that should be addressed as part of the smoking program. Linzer et al. (1996) have shown that women generally are more likely to have impaired mental health compared with men. This led them to argue that mental health screening among women was one of the more important duties of a family physician.

Depression has been documented as being more prevalent among female smokers (Borelli et al. 1996), with an association between depression and failure to quit smoking (Klimek et al. 2001), and it seems clear that without treatment of mental health problems, attempts to quit smoking are more likely to fail. Moreover, it is perhaps important for the physician to identify the quality of life impairment with the patient and when quit attempts are not successful it may be useful to try to improve, for example, mood swings, depression and other mental health phenomena as a basis for better outcomes. This may help the patient make connections between quality of life and smoking in a meaningful and productive way. Females may also be more responsive to quitting programs that focus on improvements in quality of life rather than reducing risk of disease later in life (Wilson et al. 1999). The complexity of smoking-related co-morbidity identifies a clear need for the physician to go beyond the provision of advice to quit and the use of nicotine replacement therapy and to develop a clear statement of the co-morbidity to be treated. The interrelationship of smoking with other morbidity is complex and may need to be identified on an individual basis. A recent study has also identified that smoking among subjects with depression is a form of self-medication (Klimek et al. 2001). This strengthens the need for depression to be addressed in other ways by the physician if some smokers are to quit.

This study has again shown the dose response relationship between smoking and quality of life, this time for female smokers. The connection is most marked among female heavy smokers where all cause morbidity and mortality is most likely to peak. A previous paper discussed the possibility of a smoking reduction approach that may be easier for the physician and would provide a stepping-stone to cessation (Wilson et al. 1999). The results of this study identify a supplementary burden of poorer quality of life in female smokers with which the physician has to deal. This is further complicated by the additional health screening needs in the 35 to 54 year age group of women, which compete for the physician's time and attention. Thus a stepwise approach to smoking cessation where reduction is encouraged as a goal is again best advised.

Comparisons showed that a higher proportion of female heavy smokers than male heavy smokers were separated, divorced or widowed, and unemployed, retired, a student, or undertaking home duties. This is an important issue for future public smoking cessation campaigns and there is a need to understand the narrative of this group and their smoking behaviour as a basis of improved targeting. This information would perhaps be best gained from focus groups (Graham 1994). These factors that lie at the root of smoking behaviour need to be identified and addressed in an overall approach to smoking cessation rather than simply focussing on the quit attempt. The positive association with high socio-economic status and the negative association with post-school education among female heavy smokers, when compared with male heavy smokers, may be explained by the coding used for socio-economic status. High socio-economic status included not only professional occupations, but also those defined as high-level managerial, administrative, sales and clerical occupations. These occupational groups are dominated by women and do not necessarily all require post-school education.

Recently, with the advent of social epidemiology, it has been argued that efforts to intervene with health behaviours without considering the social context in which they occur may be of limited effectiveness (Emmons 2000). It is clear that smoking programs can no longer ignore the social and developmental context of groups and while we intervene at the individual level we must also consider the factors and motivators within the broader social context that maintain unhealthy behaviours. To begin to understand the contextual influences that have developed and maintained smoking behaviour in female heavy smokers we must listen to their narrative in more qualitative situations.

Zusammenfassung

Gesundheitsbezogene Lebensqualität von starken Rauchern und Raucherinnen

Fragestellung: Starke Raucher sind ein Segment der rauchenden Bevölkerung, das eine erhöhte raucherbezogene Morbidität aufweist und am wenigsten wahrscheinlich einen Rauchstopp schafft. Die Studie identifiziert den Einfluss von starkem Rauchen auf die Lebensqualität nach Geschlecht und beschreibt Untergruppen, um diese besser für Programme und Initiativen zu gewinnen.

Methoden: Südaustralische repräsentative Bevölkerungsdaten (n = 3 010) wurden benutzt, um die gesundheitsbezogene Lebensqualität, gemessen mit dem SF-36, von starken Rauchern und Raucherinnen zu vergleichen.

Ergebnisse: 18 % der rauchenden Bevölkerung wurde als starke Raucher klassifiziert. Es gibt eine klare Dosis-Wirkung-Beziehung zwischen Anzahl gerauchter Zigaretten und Verschlechterung der Lebensqualität bei Frauen. Starke Raucherinnen sind auf allen Dimensionen der gesundheitsbezogenen Lebensqualität signifikant beeinträchtigter als starke Raucher.

Schlussfolgerung: Die Beziehung zwischen Rauchen und beeinträchtigter Lebensqualität ist bei Frauen ausgeprägter als bei Männern. Raucherinnen müssen als eindeutige Zielgruppe in Rauchstopp-Programmen und -initiativen identifiziert werden.

Résumé

Qualité de vie et santé des hommes et femmes gros fumeurs

Objectifs: Les gros fumeurs représentent un segment de la population qui ont un risque élevé de maladie en lien avec le tabagisme et qui sont les moins susceptibles d'arrêter de fumer. Cette étude identifie l'impact du fait de beaucoup fumer sur la qualité de vie (selon le sexe), et décrit une sous-population de gros fumeurs afin de les cibler plus efficacement.

Méthodes: Des données populationnelles représentatives de l'Australie du Sud (n = 3 010) ont été utilisées pour comparer la qualité de vie et la santé d'hommes et de femmes considérés comme des gros fumeurs (selon le test SF-36).

Résultats: Parmis les fumeurs, 18 % ont été considérés comme des gros fumeurs. Il y avait chez les fumeuses une relation dose-réponse claire entre le niveau de tabagisme et la détérioration de la qualité de vie. Comparées aux hommes, les femmes se sont révélées plus touchées dans toutes les dimensions de leur qualité de vie.

Conclusions: L'association entre le tabagisme et une qualité de vie détériorée est plus marquée chez les femmes que chez les hommes. Il est nécessaire d'identifier les fumeuses comme un groupe-cible spécifique pour des interventions et des programmes de cessation tabagique.

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Address for correspondence

Ms Catherine Chittleborough
Population Research and Outcome Studies Unit
South Australian Department of Human Services
PO Box 287, Rundle Mall
Adelaide
South Australia, 5000
Tel.: + 61 8 8226 0788
Fax: + 61 8 8226 6244
e-mail:
catherine.chittleborough@dhs.sa.gov.au