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HEALTH AND SUBJECTIVE WELLBEING IN DEVELOPING COUNTRIES: THE CASE OF ALGERIA

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WeD - Wellbeing in Developing Countries
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WeD is a multidisciplinary research group funded by the ESRC, dedicated to the study of poverty, inequality and the quality of life in poor countries. The research group is based at the University of Bath and draws on the knowledge and expertise from three different departments (Economics and International Development, Social and Policy Sciences and Psychology) as well as an extensive network of overseas contacts and specific partnerships with institutes in Bangladesh, Ethiopia, Peru and Thailand. The purpose of the research programme is to develop conceptual and methodological tools for investigating and understanding the social and cultural construction of well-being in specific countries.

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SUMMARY:
This paper explores the effects of health on wellbeing in a sample of 2,909 subjects, all participants in a wellbeing survey conducted in Algeria in 2004. The participants were divided into two groups on the basis of their yes/no responses to a question about the existence of a persistent health condition. Their scores were then compared for the Personal Wellbeing Index, objective self-report health questions, and additional items relating to culture, environment, and social networks. Correlational analyses and regressions were conducted to explore the relationship between health status, measures of health, and subjective wellbeing.

Significant differences are found between the two groups in feelings of pain, anxiety and level of normal sleep, which further validate the comparison. The results show a marginal difference in Personal Wellbeing Index score in favour of the healthier group, due principally to the effect of the Health Domain. Moreover, the healthier group showed significantly higher satisfaction with marriage, friendship and family relationships, which raises the problem of the direction of causation between the state of health and social relationships. Findings are discussed in relation to health provisions in Algeria and previous SWB research.

KEY WORDS: Health Factors, Subjective Wellbeing, Personal Wellbeing Index, Algerian population

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INTRODUCTION

In its widely quoted definition, World Heath Organisation (WHO, 1948) stipulates that 'good' health *is "…a state of complete physical, psychological and social wellbeing and not merely the absence of disease or infirmity'*. This definition has been credited with revolutionizing the views held in the first half of the 20th century about what constitutes 'good health'. However, as the notion of wellbeing (WB) is readily incorporated in that of "good health", the study of the relationship between the two is being reduced to a mere tautology. So, in this 'medical paradigm', health and WB are not sought as two distinct constructs. Furthermore, this definition may imply that the WB can be easily understood and achieved through measurement or diagnosis, and intervention through devices and techniques developed by medical scientists and practitioners.

However, this view is in contradiction with the long scientific tradition of economics which focuses on factors such as income and money availability in construing WB (Diener and Seligman, 2004). In reflecting on human wellness, it is apparent that both the medical and the economic models play down other factors, such as subjective or psychological and cultural factors.

In contrast, while recognizing the importance of objective indicators, including objective health and wealth, the Social Sciences approach stresses the need for subjectivity as a basic element for a well-balanced view of human WB, happiness, life satisfaction, or simply Subjective Wellbeing (SWB), as these terms are often used interchangeably. Here, SWB is generally defined as a combination of: high general life satisfaction, high life domain satisfaction, frequent positive affect, and infrequent negative affect (Diener, 1984; Diener, Suh, Lucas and Smith, 1999). Of course, one should acknowledge that there are many variations within this general tendency. For instance, eudemonic and hedonic dimensions of happiness and SWB have been identified by Ryan and Deci (2001). The hedonic perspective proposes that SWB is a matter of how much pleasure one can get, while the other view prefers to see it in the development of one's potentials and the exercise of reason (Helliwell, 2005). Researchers differ in deciding which of these aspects should be included in a theoretical framework and hence guide empirical endeavours, including the choice of measurement tools.

With regard to the role assigned to health factors in bringing about SWB, it seems that there has been a shift in how it is viewed, even by social scientists. For instance, early reviews of research (e.g., Wilson, 1967;

Diener, 1984) emphasised the importance of health factors as major determinants of satisfaction with life (LS) and SWB. More recently some researchers have argued that this relationship is moderated by other intervening factors and the direction of causation remains controversial. Helliwell and Putnam (2005), for example, agree that health is an important determinant of SWB but argue that a large body of research is already suggesting that social factors strongly condition health and that "…it is plausible to conjecture that health constitutes one pathway through which social factors influence subjective well-being…" (p. 346).

Growing research evidence has lead social scientists to a move away from hypothesizing a straightforward relationship between health and SWB, as health difficulties are not found to prevent one from displaying high levels of SWB. Cummins (1995) hypothesised the existence of a psychological, homeostatic mechanism that maintains an average level of LS at around 75 Percent of Scale Maximum (% SM in Western populations. He noted that even people who have survived organ transplantation for a number of years and people with a mild or moderate level of intellectual disability living in the community do not differ from the normative range. Yet, it should be mentioned that the reliability of SWB measurement in this latter group has been questioned (see Hatton and Ager, 2002). It has also been found that people over 65 years, people with a physical disability, or with a low income, are on the lower margins of the normal range. People with a chronic medical condition, on the other hand, have a mean value well below the two standard deviation range (p.193-195). Further empirical evidence (Cummins, Eckersley, Lo and Okerstrom, 2004) indicates that when people suffering from a physical and psychological health condition needing treatment (N = 502) and people with no such conditions (N = 1147) are compared, significant differences are detected in their Personal Wellbeing Index (PWI). These differences occur in three domains: health, achievement in life, and community connectedness (p. 79). Despite this their overall LS remains within the SWB range of the general population.

Moreover, in their review of three decades of SWB research, Diener et al. (1999) have criticised the earlier assertion that a 'bad' state of health reduces SWB ratings considerably and over a long period of time. They note the role of habituation and adaptation in bringing back SWB to its initial level whenever the decrease happens.

In all cases, the notion of the existence of a 'genetically' set point for SWB has recently gained a lot of consensus among social scientists (Lucas, Clark, Georgellis and Diener, 2003). This notion suggests that, while the

difficulties a person suffers from in their life, including health problems, may lead SWB to fall under the set point, or even momentarily increase beyond it if the person experiences positive/happy events such as winning a lottery (Brickman, Coates and Janoff-Bulman, 1978), this will not last long as SWB will return to its previous level. Cummins (2005) attributes this to the natural functioning of the homeostatic system. Other researchers suggest looking at adaptation or habituation in order to better understand the dynamics of SWB (see Lucas et al., 2003). In line with this debate, Diener, Lucas and Scollon (2006) have recently proposed some revisions of the set point theory. They argue that individuals' happiness and SWB are governed by a multitude of set points which are partly dependent on their temperaments.

Among the critiques that can be readily directed at this theory is that it implies that life experiences are comparable in terms of weight and effect on the different people and across different life situations. It also downplays the role of people's social, cultural and physical environments. One would assume, for example, that a serious health problem would be weighted differently in terms of its impact on the person and their immediate social relationships in a context that does not provide appropriate infrastructure, medical, or psychological care, as is the case in the majority of developing countries. In this respect, we agree with McAlister (2005) who notes that "the connections between the wellbeing literature and environmental and sustainable development studies are often weak, and require further development" (p. 2). In this paper, we argue that external factors play a decisive role in managing people's levels of SWB; therefore the social and economic contexts are in no way neutral. This proposition is exemplified in the study of the effects of health difficulties on population's SWB in developing countries.

In fact, there is little research from developing countries exploring the relationship between health and SWB. Within the important project of Wellbeing in Developing Countries ESRC Research Group (based in Bath University, U.K, www.welldev.org.uk), Jongudomkarn and Camfield (2006) have found that health and longevity are so important that they have been ranked second after family relations, and precede even aspects such as income and having money on the list of the major sources of difficulty and challenges to happiness in people's lives in rural and peri-urban areas in Northeast and Southern Thailand[1]. Moreover, research has already proved that there is a wide gap between levels of SWB in developing compared to developed countries (e.g., Diener and Seligman, 2004; Lucas et al., 2003).

[1] The importance of health was supported by further WeD research in Ethiopia, Peru, and Bangladesh; see Camfield 2006.

This is corroborated by findings in Algeria where the mean level of LS in 2003 was 48.73 (SD = 29.77) (Tiliouine, Cummins and Davern, 2006). The level did not exceed 61.90 (SD = 24.01), even with improvements in security and macro-economic indicators (SD = 24.01) (Tiliouine, in press). This is far lower than the equivalent figure of 77.48 in Australia (SD = 17.35, N = 31534, International Wellbeing Group, 2006). Usually general and interrelated factors such as GDP, politics, or even culture are cited to explain such a gap. However, people's concern with their health and local health provision may explain a large part of such a gap and evidence gathered by Jongudomkarn and Camfield (2006) partially supports this view.

In this paper, we study the relationship between health and SWB by comparing responses of two groups, drawn from a large survey conducted in Algeria, on a number of heath and SWB domains (the groups were people who identified themselves as suffering from a health condition needing treatment and those who stated that they did not have a health condition needing treatment) Taking into account the size of the sample and the robustness of the measure, this approach is expected to shed some light on the characteristics of the people who suffer health problems in the particular context of the study, and their ratings of satisfaction with a wide range of life domains.

In order to contextualise this research, we will start by briefly describing the health system in Algeria. We will then describe the research procedure, present the results, and discuss the main findings.

HEALTH PROVISIONS IN ALGERIA

Algeria is a developing country which shares with similar countries health resource shortages and inadequacies in basic health infrastructure for its 32 million inhabitants (annual population growth rate: 1.7, 2003). It has also an inadequate number of physicians (1 per 1000 people), and hospital beds (2.1 per 1000 people) (Algeria profile, March 2006 Library of Congress, *Web document*). In comparison, the average number of physicians in Europe is almost double, at 279 per 100 000 population (Aikins and Marks, 2007: 390).

However, Algeria has made great advances in preventive health care and increased life expectancy at birth to 71.4 years (in 2004) (WHO, 2006a). It has a fairly effective immunization programme: BCG (tuberculosis), 98% in 2003; 1 year olds with 3 doses of DTP (diphtheria, tetanus, and whooping cough), 87%. Its health system meets some of the needs of the population:

92% of births were attended by skilled personnel in 2000, and births in health facilities reached 92% in 2000. The level of mortality for children under 5 years has gone down to 41 per 1000 live births (in 2003). Expectation of lost healthy life years at birth in 2001 was equivalent to 11.9 years (males) and 11.2 years (females), which lead to a percentage of total life expectancy lost in 2001 to 17.6 (Males) and 15.8 (Females). Nevertheless, much remains to be done. Unexpectedly, WHO places Algeria amongst African countries with high child and high adult mortality, alongside sub-Saharan countries such as Niger (2006b). Meanwhile, most other Arab countries such as neighbouring Tunisia and Libya appear amongst the low child and low adult mortality group (p. 184).

Total expenditure on health has increased from 3.8 percent of GDP in 1998 to to 4.3 percent in 2003. Additionally, government expenditure on health, as a percentage of the total amount spent on health, has increased from 65.6 percent in 1998 to 74 percent in 2002. The share of private expenditure on health has therefore decreased from 34.4 percent in 1998 to 26 percent in 2002. General government expenditure on health (as a percentage of total government expenditure) has also increased from 8.1 percent in 1998 to 9.1 percent in 2002. So, per capita expenditure on health (calculated in USD ppp) has increased from $62 in 1998 to $77 in 2002 (WHO, 2006a). These figures are an accurate representation of the gradual improvements and efforts made in order to ensure accessibility of health facilities to the population.

However, it should be pointed out that the level of government expenditure on health has fluctuated across time according to the availability of funds, which relies heavily on income from the hydrocarbon sector (about 95% of its exports). The sharp decrease in oil prices during the 1990's (12 USD a barrel in 1988, compared to 60 USD in 2006), combined with a devastating political crisis and growth in terrorist insurgency, had enduring effects on the functioning of public life, including the health system.

The effects of this period are evident from epidemiological research on mental health conducted in 1999-2000 using a random sample of the adult population, which estimated that 91.9% of these adults were victims of a traumatic event. Of those, 39.5% suffered from post-traumatic stress disorder, 23.3% from a mood disorder (depression), 38.5% from an anxiety disorder (e.g., panic disorder or phobia), and 8.7% from somatoform disorder (Khaled, 2005). Similar findings were reported by De Jong, Comproe, and Van Ommeren (2003) from research with 653 subjects living in the surroundings of the capital city, Algiers (a peri-urban area exposed to

large massacres). They concluded that Post-traumatic Stress Disorder (broadly defined), and other anxiety disorders were common problems in the sample, and related to experience of violence linked with armed conflict (as has been found in countries such as Cambodia, Palestine and Ethiopia).

A Ministry of Health survey on the prevalence of chronic neurological and psychiatric disorders conducted in 2001 suggested that 155,000 persons suffer from such disorders (i.e., 0.5% of the Algerian population) and another 62,000 have epilepsy, i.e., 0.2% of the population (*Ministère de la santé et de la réforme hospitalière*, 2004). Those aged less than 40 years are most affected. At relation to the incidence of epilepsy, these figures are slightly higher than in other third world countries (i.e., 0.19%) as reported by WHO (2006b: 58).

Equity in access to health facilities can be problematic in a country where wealth often results from manipulation of power, being a member or servant of the ruling party, or even operating a business based on smuggling products such as cigarettes, alcohol, drugs, etc. These options exist within a basically rentier economic system where people enjoy economic power out of proportion to their contribution through hydrocarbon exportations, rather than hard work and constructive creativity. As a result, 45% of wealth is concentrated in the hands of 5% of the population. This phenomenon is explained by Library of Congress (2006) by collusion among businessmen, public officials, and military officers (p.11). So, access to the private health sector depends on means that not everyone has access to, while the public health system is far from meeting the population's vital needs.

Many challenges to the health sector remain such as the rehabilitation of the social security system and the improvement of health services management, with an appropriate system of accountability. Disease prevention could be improved by providing sufficient safe water as this is a factor in the severe annual epidemics (Ministère de la santé, de la population et de la réforme hospitalière, 2004). Effective health promotion programmes could provide better support for the community in managing the challenges of daily life. Providing efficient training for medical staff, supporting psychologists, and improving health related research are also important at this stage. For example, social scientists could help decision makers and medical researchers and practitioners identify priority areas for well informed interventions and help design future developments of the health sector. For instance, with the current slow down of the population's growth rate after the baby-boom of the 1970s, Algeria's population, like that of many other developing nations, will soon face age-related disabilities and

health problems. Such a situation cannot be appropriately handled without a specially designed future programme.

Studying the relationship between mental and physical health and SWB is clearly beneficial; not least because the wellbeing of the consumers needs to be measured as a criterion for the effectiveness of any health system. So, this approach can be a valuable source of information in monitoring and evaluating the effectiveness of health policy design and implementation in a developing country setting.

So, taking into account the specifics of the context, our aim in this study is first to establish the SWB of the general population and then to study the effects of health losses through a systematic comparison between self-identified healthy and unhealthy individuals. The correlations between LS and ratings of different satisfaction domains will be also presented, along with an estimation of the contribution of health factors in LS.

METHOD

Participants

Data are drawn from the second Algerian Wellbeing Survey, conducted in Spring 2005. They have been collected from a convenience sample through supervised self-report and interview administered questionnaires (to ensure the inclusion of respondents who cannot read). Researchers attended to families in their homes, people on the streets, in different institutions, in university halls, in libraries, in professional colleges, in administrative centres, and in any place where people were able to complete the questionnaires in the presence of an interviewer. The sole criterion for exclusion from the sample was being under the age of 18.

Out of the total number (N = 2909), 1463 people are female (50.3%) and 1446 (49.7%) are male. About half of them fall within the age category of 18 to 25 years, and 2.3% are aged over 56 years (N = 87). In general, this fits with the age structure of the whole Algerian population which is predominantly young. Additionally, due to the sampling strategy, 40.1% have a university education and 61.9% (N = 1800) are single. While 35.8% of the sample fall below the level of the legally binding minimum wage (*salaire national minimum garanti*, SNMG), this may be because many respondents are students or housewives. Unfortunately, we cannot rely on these figures as accurately reflecting personal incomes. This is due to the operation of the dominant informal economic system as described in Tiliouine et al. (2006) where most economic activities are out of

governmental control, dominated by parallel markets to escape government fiscal regulations and taxes.

34.6 % of the total sample (N = 1007) reported being married and 91.26% (N = 919) of married respondents had children. The number of children ranges from one to 12, with 165 subjects having more than 5 children. Respondents have been also asked to indicate the area where they normally live with their families. 238 respondents (8.2%) identify their area as ‘rural’, 957 (32.9%) as a ‘small village’, 944 (32.5%) as a ‘meduim city’, and 770 (26.5) as a ‘big city’ (more details about the procedure can be found in Tiliouine (in press)).

MEASURES

The Personal Wellbeing Index (PWI)

The Personal Wellbeing Index (PWI) is a self-report measure that asks how satisfied people are with seven life domains: standard of living, personal health, achievement in life, personal relationships, personal safety, community connectedness and future security. One of the advantages of this measure is that these seven domains are a result of the deconstruction of the single item: satisfaction with life as a whole, which is frequently used by researchers to assess happiness and wellbeing. PWI overcomes the problem of low reliability for single item- measures and also allows for comparisons between population groups on the basis of component domains (Cummins et al 2003). So, it is a powerful descriptive tool that allows for the assessment of changes in WB of any population.

Our use of this Index (Tiliouine et al., 2006) with a sample of 1417 respondents has shown good sensitivity, validity and reliability which is in agreement with findings in samples from other countries. This makes the PWI suitable as a cross-cultural tool for the measurement of subjective wellbeing. For example, in Australia, the PWI has a minimum Cronbach alpha value of (.70), indicating that the scale is highly coherent; in this study, it is: (.73).

All the items in the scale showed an item-total correlation ranging between .49 and .70. The seven items of personal wellbeing index loaded .66 to .77 on their factor and explained 52.69% of the variance in our first survey (Tiliouine et al., 2006), and 38.2% in the present one. Although it is difficult to explain such a decrease in the explained variance, a number of reasons can be proposed. For example, in the second survey the PWI was embedded in a much longer questionnaire, and the population was also

experiencing reductions in terrorism and improvements in economic prospects which may have affected weightings of population life domains (Tiliouine, in press).

Additional Wellbeing Items and measures of Health factors

In addition to the measure described above, respondents were asked to rate their satisfaction with twelve individual items in order to explore the relationship of other aspects of life with SWB and health factors. The additions cover satisfaction with: neighbourhood, friendship, housing, marriage, scientific culture, literature/artistic culture, religious culture, family relationships, spare time use, own personality, physical appearance, and the extent of personal optimism. Similar items have been used in previous research to explore the correlates of quality of life in diverse world regions (e.g., Park and Shin, 2005).

The measures of health factors included items dealing with whether the respondent suffers from persistent health problems that need treatment (i.e., health condition), whether he/she consulted a traditional healer, frequency of: daily physical pain, daily anxiety, and daily normal sleep. Each of these was judged as highly important indicators of population health and some of them were used in previous survey research (e.g., Cummins et al., 2004). For example, in Algeria, there are a variety of traditional healers. Some of them use witchcraft techniques, while some others use the holy Koran and herbal medicines. Although not all the people attend traditional healers, it seems that many of them prefer doing so, either because they do not have the means for expensive modern health treatments, or because they use both in parallel to increase their chance of a cure. For this reason, use of traditional healers is taken here as an indication of the severity of the condition (the author is conducting more research to clarify these points).

Procedure

The majority of the data was collected by student volunteers, selected on the basis of the area in which they live, as our intention was to cover the whole western part of the country. All the students had finished three years of psychology and were working on their undergraduate dissertations or postgraduate theses. They were not given sampling guidelines but were instructed to collect as many questionnaires as possible in the area in which they lived and within the assigned period of one month (March to April, 2005).

Meetings were held with the students prior to data collection where they completed the questionnaire and commented on its contents and the clarity

of the language. They were also provided with information on the research and discussed survey logistics. Finally, they were given written instructions, which included a glossary of the main concepts, as well as printouts of the 6-page printed questionnaires which included an introduction to the research, the PWI, additional items relating to wellbeing, religiosity, and health factors, and personal information. Four senior researchers, all members of the Laboratory of Educational Processes and Social Context (Labo-PECS) in the University of Oran, assisted in field work supervising data collection and closely following the whole operation with interviewers.

Prior to data analysis, we checked for outliers which resulted in the exclusion of 31 questionnaires, i.e. 1.05% of the sample. 2909 questionnaires were retained for analysis. As suggested by Cummins et al. (2003), Likert scales on all items were standardized into units of percentage of Scale Maximum (%SM) on a 0 to 100 distribution to facilitate comparability of the results. The sample was divided into two groups of people on the basis of their yes/no answers to the question: "*Do you suffer from any health problems that need treatment such as hearing or sight or any other handicap*". The demographic characteristics of the two groups are reported below (see Table 1). Afterwards, we compare their ratings of PWI, specific satisfaction domains, and other health issues. Finally, the contribution of health factors to LS for both groups will be assessed.

Sample Characteristics

Out of the total number of 2907 respondents, 18.54% (539 subjects) described themselves as suffering from health problems needing treatment. 52.3% (282 subjects) of these were female (Table 1). This seems to suggest that, a slightly greater number of females suffer health deficiencies compared to men; however, this trend is reversed beyond the age of 36 years where the proportion of men is greater than that of women.

TABLE 1: Characteristics of the health groups

		Healthy		Unhealthy	
		N	%	N	%
Gender	Male	1187	50.1	257	47.7
	Female	1181	49.9	282	52.3
Age	18-25	1090	46.0	196	36.4
	26-35	691	29.2	135	25
	36-45	383	16.2	88	16.3
	46-55	155	6.5	82	15.2
	55+	49	2.1	38	7.1
Marital status	Single	1518	64.1	281	52.1
	Married	775	32.7	231	42.9
	Divorced	48	2.0	13	2.4
	Widowed	27	1.1	14	2.6
	Total	2368	100.0	539	100.0
Education[2]	No school.	126	5.3	58	10.8
	primary	123	5.2	34	6.3
	medium	374	15.8	81	15.0
	secondary	776	32.8	170	31.5
	university	969	40.9	196	36.4
	Total	2368	100.0	539	100.0
Income	<10,000 D	451	19.0	117	21.7
	10,000-20,000 D	615	26.0	114	21,2
	20,000 - 30,000 D	179	7.6	52	9.6
	30,000+	46	1.9	15	2.8
	Total	1291	54.5	298	55.3

D = Algerian Dinar

While 34.6% (N = 1007) of the total sample are married, this rises to 231 (42.9%) amongst the unhealthy group, which may be attributed to age differences. In terms of education, health problems are found equally across all education categories, although members of the unhealthy group are slightly older (see footnote).

55% of the unhealthy group reported having an income (298 subjects) and of these 21.7% (N = 117) fall within the minimum salary category, compared to 2.8% (15) who have the highest income (i.e. more than 3 times the official

[2] **Mean age (SD) of education groups:** No school. (Healthy: 43.07 (16.83) , Unhealthy: 53.33 (17.35)); primary: (Healthy: 35.85 (10.97) , Unhealthy: 45 (16.37)); Medium (Healthy: 30.47 (09.96) , Unhealthy: 34.95 (11.08)); secondary (Healthy: 29.54 (09.81) , Unhealthy 32.38 (11.15)); University (Healthy: 27.27 (07.44) , Unhealthy: 28.44 (08.85))

minimum salary). The equivalent figures for the healthier group who reported having an income (N = 1291) are respectively: 19% (N = 451) and 1.9% (N = 46). This indicates that health problems are slightly more common among the lower earning groups, which may also be an age effect.

It is interesting also to note 20.6 % (N = 487) of healthy people reported that they attended traditional healers to seek help for their health problems, compared to 30.4% (N = 164) of unhealthy people. This finding may indicate that people visit traditional healers although when they do not have acute health problems. Future research is needed to clarify the role played by such healers and the quality of their services compared to modern therapies.

RESULTS

Our categorization of the sample using the self-report question described earlier was confirmed by the significant differences in health related factors between the two groups, where the unhealthy group reported higher levels physical pain, and anxiety and lower levels of daily normal sleep (degree of physical pain: $t(2343, 534) = -10.94$, $p = .000$; daily anxiety $t(2356,537) = -5.06$, $p = .000$; daily normal sleep $t(2357, 537) = 2.74$, $p = .006$; and satisfaction with health: $t(2356, 539) = 12.14$, $p = .000$). The unhealthy group is also far less satisfied with health in general (Table 2). The scores for the PWI and the specific areas of: friendship, marriage, family relationships and physical appearance were also significantly higher in the less healthy group (Table 2). Importantly, the figures suggest that people in the unhealthy group feel less satisfied with the social support they receive from spouses, family members, and friends, although they did not score significantly lower means in the general domain of personal relationships and neighbourhood.

TABLE 2: Comparisons between those having a health condition and those who have not

		Health problems	N	Mean	SD	t
L.S		No	2359	61.96	24.26	
		Yes	538	61.71	22.88	.22
PWI		No	2296	64.58	15.27	
		Yes	527	62.63	15.35	2.4*
PWI Domains	standard of living	No	2362	60.86	24.12	
		Yes	538	58.75	23.45	1.83
	Health	No	2356	74.34	22.21	
		Yes	539	61.21	24.51	12.14**
	life achievements	No	2354	56.14	25.61	
		Yes	537	55.61	25.08	.44
	personal relationships	No	2353	65.47	26.01	
		Yes	534	66.70	25.19	-.10
	personal security	No	2354	68.97	24.92	
		Yes	538	67.83	24.41	.10
	belongingness to society	No	2358	68.74	24.91	
		Yes	537	68.27	25.28	.40
	future security	No	2354	58.46	25.81	
		Yes	537	59.72	25.65	-1.02
Additional Domains	neighborhood	No	2353	64.68	28.40	
		Yes	535	65.61	27.75	-.68
	Friendship	No	2357	68.04	25.98	
		Yes	536	65.34	26.94	2.16*
	Housing	No	2349	60.91	30.56	
		Yes	538	59.31	30.71	1.09
	Marriage	No	764	79.49	21.73	
		Yes	229	75.28	23.48	2.52*
	scientific culture	No	2353	54.37	22.99	
		Yes	536	52.26	24.47	1.90
	literature and artistic culture	No	2362	51.38	23.93	
		Yes	535	49.57	25.40	1.55
	religious culture	No	2363	59.27	23.54	
		Yes	539	58.40	23.84	.77
	family relationships	No	2359	74.86	22.96	
		Yes	538	71.41	24.40	3.10**

	use of spare time	No	2359	49.94	25.75	
		Yes	536	48.88	26.36	.85
	own personality	No	2354	69.82	21.20	
		Yes	539	67.96	21.77	1.83
	extent of personal optimism	No	2354	70.18	23.59	
		Yes	538	70.39	24.37	-.18
	physical appearance	No	2354	74.59	20.75	
		Yes	538	70.85	21.36	3.75**
health factors	degree of daily physical pain	No	2343	29.85	24.49	
		Yes	534	42.98	27.21	-10.94**
	degree of daily anxiety	No	2356	46.38	28.15	
		Yes	537	53.17	27.53	-5.06**
	degree of daily normal sleep	No	2357	64.37	23.18	
		Yes	537	61.28	25.06	2.74*

**p < .005, *p < .05

Exploring the contribution of health factors to wellbeing for people in both health groups

Table 3 shows the correlations for the healthy and the unhealthy group to enable exploration of the pattern of relationships between the different studied variables and LS.

TABLE 3: Correlations between the measured aspects and LS in both health groups

		LS Healthy Group	LS unhealthy Group
PWI		.565***	.591***
PW Domains	Standard of life	.464***	.477***
	Health	.301***	.323***
	Achievements	.403***	.371***
	Personal relationships	.297***	.309***
	Personal security	.315***	.302***
	Belongingness	.316***	.361***
	Future Security	.365***	.388***
Specific Domains	Neighborhood	.241***	.196***
	Friendship	.209***	.240***
	Housing	.272***	.282***
	Marriage	.279***	.282***
	Scientific Culture	.233***	.214***
	Literature/art. Culture	.170***	.136**
	Religious Culture	.170***	.202***
	Family Relationships	.273***	.314***
	Spare time	.287***	.275***
	Personality	.206***	.257***
	Optimism	.350***	.417***
	Physical Appearance	.257***	.261***
Health Factors	Pain	-.052*	-.115*
	Anxiety	-.185***	-.187***
	Normal Sleep	.162***	.163***

*p < .01, **p < .001 ***p < .0001

All correlations are significant across both groups, and a similar pattern of relationships between LS and other studied factors has been found in the two groups. However, the majority of correlations are slightly stronger in the unhealthy group. As expected, the correlations of LS with Pain and with Anxiety are negative and significant in both groups. The strongest positive

correlation is found between LS and PWI in both data sets (.565 and .591), followed by LS with Standard of life (.464 and .477). Much lower correlations are noticed between LS and scientific, literary/ artistic, or religious culture, and between LS and sleep.

Regression analyses were used as a further means of determining the contribution of health factors in LS, and revealed a similar pattern in both groups (Table 4). While unexpectedly physical pain does not make a significant contribution, both anxiety and normal sleep significantly predict LS. Interestingly, the level of significance is much higher in the healthy group, which demonstrates the importance to LS of being in good health, rather than merely avoiding illness.

Table 4: Regression of health factors on LS

	Healthy Group (N = 2368)		Unhealthy Group (N = 539)	
	B	**B**	B	**β**
Physical pain	.032	.032	-.029	-.035
Anxiety	-.147	-.172***	-.125	-.150**
Normal sleep	.134	.028***	.123	.134*
	R2=.05 Adjusted R^2=.05		R2=.053 Adjusted R^2=.048	

*p < .005, **<.001, *** p < .000

DISCUSSION

This study has tried to evaluate the impact of health related factors on LS and SWB in Algeria, using it as a case study among developing countries. The approach is based on a comparison of the scores of people identifying themselves as having a health condition needing treatment (N = 539 out of 2907 responses, 18.54%) and those who without a condition needing treatment. A potential shortcoming of the study is that the percentage of unhealthy people is the sample is relatively small, possibly due to the youth of the respondents, or the wording of the question which specifies receipt of treatment and uses physical disabilities as examples. In comparison, Cummins et al. (2004) reported higher figures when a sample of 1649 Australians were asked: "*Do you have a medical or psychological condition that makes you visit the doctor on a regular basis*" (28.4% (N = 261) of men and 31.7% (N = 309) of women answered yes). In both studies unhealthy

women outnumbered unhealthy men, this may reflect a greater readiness among women to express their feelings, both positively and negatively, about their health status. Although our evidence is limited, it seems that health problems are more frequent among low income groups, and may result in growing health inequalities. This seems plausible in the context of a developing country with an emerging market economy, which is managing the aftermath of a national crisis that badly affected the state of health of the whole population without effective social security provision (Khaled, 2005; De Jong et al., 2003).

As in previous studies (mainly Cummins et al., 2004), health conditions did not affect general satisfaction with life, but had a marginal affect on the total PWI score ($p < .05$). This may be explained, however, by the large difference between the two groups in satisfaction with health, which is one of the constituent domains of PWI.

We have found that anxiety is quite high among the sample (N = 2894, Mean = 47.65, SD = 28.15), and particularly among the unhealthy group (53.17, SD = 27.53). In comparison, Abdel-Khalek and Naceur (2007) found lower scores with a younger group of 244 Algerian College students (mean age = 21.96; SD = 3.02) using an 18-item scale, which has a theoretical mean of 45.00 (Males: N = 109, Mean = 37.36, SD = 10.56; Females: N = 135, Mean = 39.59, SD = 10.34). When converted to a scale maximum percentage of 0-100 point scale, these scores translate to 46.7 for males and 49.49 for females. This implies that health difficulties exacerbate feelings of anxiety and are linked to greater frequency of pain and lower frequency of normal sleep. An influential report from the Algerian Ministry of Health attributed the increase of psychological and mental disorders among those under 40 years old to “everyday life pressure” and “*la malvie*” (low quality of life) (*Ministère de la santé et de la reform hospitalière*, 2004).

Nevertheless, LS means have not been affected by the presence of health problems, and the correlations and regression analysis show a similar pattern in both health groups. The reason for this may be technical, for example, the LS figures for the population which are used as the dependent variable are relatively low (Mean = 65.55, SD = 23.73). While the LS figures are much lower than the normal range observed in developed countries, e.g., 77.48 (SD = 17.35) in Australia (International Wellbeing Group, 2005), they are not artefactual as they are corroborated by findings of the first survey (Tiliouine et al., 2006) and Abdel-Khalik and Naceur (2007) study. The low scores, combined with the high levels of reported anxiety, suggest that the general population endures great pressures in its daily life.

However, the causes of this and future implications need to be studied further.

The implication of this study for the set point theory of SWB is that while physiological and genetic influences are important, the effects of inequality, poverty, and underdevelopment should not be ignored, as they explain much of the variation in happiness between individuals, groups and nations. Although our results should be taken with some caution, future research in developing countries should devote more attention to the study of health in relation to the generic notion of SWB as many benefits could be attained. Firstly, it helps in identifying priority areas where SWB is more fragile and hence directs future interventions to alleviate people's sufferings. Secondly, SWB scores can be a source of data in evaluating the quality of medical and psychological care. Thirdly, they provide a good criterion for judging and improving health policy efficiency, if the goal of health is truly to increase "physical, psychological and social wellbeing" (WHO, 1949). Finally, at the preventive level, it has been shown that although happiness does not cure illness, it does protect against becoming ill (Veenhoven, *in press*).

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REFERENCES

Abdel-Khalek, A.M. and Naceur, F. (2007), 'Religiosity and its association with positive and negative emotions among college students from Algeria', *Mental Health, Religion and Culture, 10(2),* pp. 159-170.

Aikins, A.D. and Marks, D.F. (2007). Health, disease and healthcare in Africa. *Journal of Health Psychology, 12 (3)*, pp. 387-402

Brickman, P., Coates, D. and Janoff-Bulman, R. (1978), 'Lottery winners and accident victims: Is happiness relative?', *Journal of Personality and Social Psychology, 36(8),* pp. 917-927.

Camfield, L. (2006),.'Why and How of Understanding 'Subjective' Wellbeing: Exploratory work by the WeD group in four developing countries'. WeD Working Paper 26.

Cummins, R.A. (1995), 'On the trail of the golden standard for subjective well-being', *Social Indicators research, 35,* pp. 179-200.

Cummins, R. A. (2005), 'Caregivers as managers of subjective wellbeing: A homeostatic perspective', *Journal of Applied Research in the Intellectual Disabilities, 18,* pp. 335-344.

Cummins, R.A., Eckersley, R., Lo, S.K. and Okerstrom, E. (2004), *Australian Unity Wellbeing Index Survey 10 - "The wellbeing of Australians – Health and body weight".* Melbourne: Australian Centre on Quality of Life.

Cummins, R.A., Eckersley, R., Pallant, J., Van Vugt, J. and Misajon, R. (2003), 'Development of a national index of subjective wellbeing: The Australian Unity Wellbeing Index', *Social Indicators Research, 64*, pp. 159-190.

De Jong, J.T.V.M., Comproe, I. H. and Van Ommeren, M.V. (June, 2003), Common Mental disorders in post-conflict settings, *The Lancet, 361,* pp. 2128-2130.

Diener, E. (1984), 'Subjective well-being', *Psychological Bulletin, 95,* pp. 542-575.

Diener, E., Lucas, R.I. and Scollon, C.N. (2006), 'Beyond the hedonic treadmill: Revising the adaptation theory of well-being', *American Psychologist. 61(4), pp.* 305-314.

Diener, E., and Seligman, M. E. P. (2004), 'Beyond Money: Toward an Economy of Well-Being', *Psychological Science in the Public Interest, 5*, p. 1.

Diener, E., Suh, E.M, Lucas, R.E.R. and Smith, H.L. (1999), 'Subjective well-being: Three decades of progress', *Psychological Bulletin, 125(2),* pp. 276-302.

Hatton, C. and Ager, A. (2002), 'Quality of Life Measurement and People with Intellectual Disabilities: a Reply to Cummins', *Journal of Applied Research in Intellectual Disabilities,* 15 (3), pp. 254–260.

Helliwell, J.F. (2005), 'Well-being, social capital and public policy. What's new?', *National Bureau of Economic Research,* Working paper No. 11807.

Helliwell, J. F. and Putnam, R.D. (2005), 'The social context of well-being', In F.A. Huppert, Baylis, N. and Kevern, B. (Eds.) *The science of well-being*. Oxford: Oxford University Press.

International Wellbeing Group (2005). Personal Wellbeing Index. Melbourne: Australian Centre on Quality of Life, Deakin University. ISBN No: 1 74156 048 9 (http://www.deakin.edu.au/research/acqol/instruments/wellbeing_index.htm.)

Jongudomkarn, D. and Camfield, L. (2006). 'Exploring the quality of life of people in North Eastern and South Eastern Thailand', *Social Indicators Research, 78(3),* pp. 489-529.

Khaled, N. (2005), 'Psychological effects of terrorist attacks in Algeria', *Journal of Aggression, Maltreatment and Trauma, 9(1/2),* pp. 2001-212.

Library of Congress - Federal Research Division, 2006 http://lcweb2.loc.gov/frd/cs/profiles/Algeria.pdf

Lucas, R.E., Clark, A.E., Georgellis, Y. and Diener, E. (2003), 'Re-examining adaptation and the set point model of happiness: Reactions to changes in marital status', *Journal of Personality and Social Psychology, 84,* pp. 527-539.

McAlister, A. (2005), 'Wellbeing concepts and challenges'. *Discussion paper prepared for Sustainable Development Research Network*.

Ministère de la santé, de la population et de la réforme hospitalière, (2004), *La santé des Algériens et Algériennes*, Alger: Ministère de la santé, de la population et de la réforme hospitalière.

Park, C.M. and Shin, D.C. (2005), 'Perceptions of life quality among the Korean mass public: unravelling their dynamics and standards', *Social Indicators Research, 70(3),* pp. 257-286.

Ryan, R. M. and Deci, E.L. (2001), 'On Happiness and human potentials: A review of research on hedonic and eudaimonic well-being', *Annual Review Psychology, 52,* pp. 141-166.

Tiliouine, H. (in press), 'Stability and change of Personal and National Wellbeing in Developing Countries: The case of Algeria', In Moller, V. (Ed.), *Quality of Life in the New Millennium,* Springer*.*

Tiliouine, H., Cummins, R.A. and Davern, M. (2006), 'Measuring wellbeing in Developing Countries: The case of Algeria', *Social Indicators Research, 75,* pp. 1-30.

Veenhoven, R. (in press), 'Healthy Happiness: The effects of happiness on physical health and the consequences for preventive health care', *Journal of Happiness Studies* DOI 10.1007/s10902-006-9042-1*.*

Wilson, W. (1967), 'Correlates of avowed happiness', *Psychological Bulletin, 67,* pp. 294-306.

World Health Organisation (WHO 1948), *Preamble to the constitution of the World Health Organization*, New York: World Health Organisation.

World Health Organisation. (WHO 2006a), *World Health Report*, Geneva: WHO Press.

World Health Organisation. (WHO 2006b), *Neurological disorders: Public health challenges,* Geneva: WHO Press.

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