

Editorial

Historical Change in the Report of Daytime Fatigue

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Summary: Population-based data suggesting that contemporary society does not value sleep are difficult to obtain. In this report, historical change in item endorsements relevant for disturbed sleep and daytime fatigue from the Minnesota Multiphasic Personality Inventory (MMPI) generated from normative, upper Midwestern adult populations was analyzed. Response rates from the 1930s and 1980 were compared. The data indicated that, relative to individuals in the post-Great Depression/pre-World War II era, contemporary men were more likely to report fatigue and tiredness, although they were no more likely to report disturbed nocturnal sleep. The results are compatible with the voluntary curtailment of sleep typical in modern society described in the report of the National Commission on Sleep Disorders Research. **Key Words:** Fatigue—Insomnia—MMPI—Historical change.

The report of the National Commission on Sleep Disorders Research (1) has documented the pervasive lack of concern for and interest in sleep in contemporary American society. From lack of education in the primary grades to irrational schedules in the workplace to the failure of the medical profession to correctly diagnose and treat readily identifiable sleep disorders, sleep is largely ignored. Despite the fact that individuals who treat sleep disorders patients or researchers studying sleep are well aware of these issues, population-based data suggesting that modern American society neglects sleep are difficult to find. Some evidence of an expanding 24-hour, service-oriented economy can be inferred from data suggesting that about 26% of men and 18% of women in the workforce now engage in shiftwork, a trend that had been increasing at the rate of about 3% per year as of 1986 (2). Historical perspective on total hours in the workplace also provides some clues as to how sleep may be short-changed in contemporary society. For example, there has been a marked decline in leisure time experienced by American workers over the last 20 years. Annual hours of work have increased from 1,786 in 1969 to 1,949 in 1987 (3). Presumably, time for sleep is included among such "leisure" hours. Even among college students, reported sleep duration appears to have decreased about 30 minutes over the decade from 1978 to 1988 (4), suggesting it has become commonplace, or perhaps even fashionable, to

curtail voluntarily the time allotted to sleep. Finally among healthy, working age adults, 50–65 years old, the modal number of hours of nocturnal sleep appears to have fallen from 8.0 to 8.9 hours per night based on the American Cancer Society 1959 survey (5,6) to 7.0 to 7.9 hours per night in the mid-1980s (7). In the latter study, a substantial segment of the more recently sampled population (about 27%) appeared to obtain only between 6.0 and 6.9 hours of sleep at night (7).

In this report we present cross-sectional data on nocturnal sleep and daytime fatigue using a previously published database (8) that examined comparably sampled, representative, upper Midwestern, rural adult populations in the mid-1930s and the mid-1980s. The purpose of this report was to examine the hypothesis that a contemporary adult population reports symptoms of insufficient sleep relative to a population of comparable demographics sampled 50 years previously.

METHODS

The databases used to generate this report were derived from studies of psychiatrically *normal* populations who were administered the Minnesota Multiphasic Personality Inventory (MMPI) as a part of norming studies in the 1930s and then again in the 1980s. Data on control populations were gathered with the MMPI to provide a basis for comparison with various psychiatric disorders. The MMPI was designed as an objective self-report test to differentiate psychiatric populations [for background see Colligan et al. (8), Greene (9), and Dahlstrom and Welsh (10)]. It consists of 566 items that can be answered true or false. Various scales on the test

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TABLE 1. Percentage of 1930s and 1980s population endorsing items related to disturbed nocturnal sleep and daytime fatigue

Description of item content	Keyed direction	MMPI item no.	Percentage endorsed			
			1980 males	1930 males	1980 females	1930 females
Disturbed nocturnal sleep						
Easily awakened	T	5	40.9	32.7	61.8	59.2
Nightmares	T	31	06.9	05.4	06.9	07.7
Restless sleep	T	43	09.2	07.2	12.2	16.3
Thoughts disturb sleep	F	152	21.7	25.9	27.2	26.2
Dream frequency	F	329	63.6	46.2 ^a	69.0	63.9
Daytime fatigue						
Feel rested	F	3	26.3	17.9 ^b	27.0	24.9
Trouble functioning	T	41	21.8	14.0 ^b	20.7	25.8
Stamina	F	163	33.1	19.7 ^a	39.8	37.8
Nap during the day	T	211	03.0	03.6	05.7	04.2
Energetic	F	272	05.3	10.3 ^b	08.4	08.0
Sleep unnecessary	F	505	82.3	61.9 ^a	89.2	70.9 ^a

^a $p < 0.001$.^b $p < 0.05$.

are used to generate scores that indicate the likelihood that an individual is likely to be, for example, depressed, manic, or schizophrenic. A number of items on the MMPI specifically deal with sleep and/or fatigue (see Table 1), and it is these items (for the control populations) that generated the data on which the current report is based. Specific item data were derived from Appendix L in the Colligan et al. (8) book.

The control population used in the 1930s norming sample for the MMPI consisted of visitors, ages 16–65, who were bringing friends or family members to the University of Minnesota hospitals and clinics. The age distribution was approximately as follows: 16–25, 28%; 26–43, 53%; 44–54, 15%; 55–65, 4%. As described by Hathaway and McKinley (11), Dahlstrom and Welch (10), and later elaborated upon by Colligan et al. (8), the majority (70%) of these individuals were approached individually and were invited to participate in the research project and then questioned regarding current and prior medical/psychiatric conditions and current medication use. Only if responses were negative were individuals included in the normal population. The population was described as predominately rural. Names were not recorded, however, other identifying demographic information (age, gender, marital status, educational level, and occupation) was noted. All subjects were volunteers and were not paid for participation. According to Colligan et al. (8), individual response item data were still available on 224 men and 315 women of this group, and the data from these individuals provided the data to be presented below.

The 1980s control population was derived from Census Tract sampling of 1,919 households in 198 communities in Minnesota, Iowa, and Wisconsin within a 50-mile radius of Rochester, MN. Individuals were selected at random and initially sent a letter of introduction describing the nature and goals of the project

(8). Households were then contacted by telephone and eligible individuals were screened for any medical or psychiatric disorder and for willingness to complete the MMPI as a part of a volunteer research project. Although both spouses in a given household were eligible to participate, other relatives (e.g. siblings, cousins, children) were excluded from participating. Further details regarding the household sampling procedure are available in Colligan et al. (8). While a few large cities of over 25,000 were sampled, the majority of sampling was derived from small town rural populations. Of the 198 towns selected for sampling, 189 had populations of less than 5,000. The MMPIs were obtained from a total of 1,408 individuals (86% of those eligible). The age distribution was approximately as follows: 18–19, 5%; 20–29, 24%; 30–39, 19%; 40–49, 14%; 50–59, 15%; 60–69, 12%; 70 and above, 11%. A subset (305 men and 335 women) of these individuals was randomly selected and became the contemporary comparison group whose data are reported upon below.

RESULTS

Endorsement rates for the five MMPI items related to disturbed nocturnal sleep and for the six items related to daytime fatigue are shown in Table 1 separately for men and women. Data shown reflect percentage of each group endorsing each item in the keyed direction. Of immediate note in Table 1 is that most of the items related to disturbed nocturnal sleep including being easily awakened by noise (no. 5), nightmare frequency (no. 31), restless sleep (no. 43), and absence of disturbing thoughts interfering with sleep (no. 152) showed no evidence of historical change. Men in 1980 reported a greater likelihood of dreaming (no. 329), suggestive of

greater sensitivity to affective experience relative to men from 50 years previously.

In contrast to items relevant to disturbed nocturnal sleep, nearly all items relevant to daytime fatigue showed historical change in men. Contemporary men were more likely to admit to feeling unrested in the morning (no. 3). They also acknowledged trouble in functioning and ability to "get going" (no. 41). The item relevant for stamina (tiredness) (no. 163) also showed historical change suggesting more freely admitted fatigue. Daytime nap tendency (no. 211) showed no evidence of change over time. Responses to going without sleep (no. 505) due to abundant "pep" were also indicative of more fatigue in both contemporary men and women. Only the item regarding energy level (no. 272) showed an effect in the opposite direction (less fatigue in the contemporary sample), although the low absolute levels of endorsement of this item suggest this was an uncommon response for individuals of any era.

DISCUSSION

When placed in the context of changing habitual sleep durations cited in several other reports over far shorter periods of time (4,7), these data indicate that there may be changes in how Americans, particularly men, report their own level of alertness and arousal. Whether this could be demonstrated with objective measures of daytime sleepiness such as the multiple sleep latency test or maintenance of wakefulness test is unknown, as is whether the report of tiredness itself might be a reflection of historical changes in other variables [e.g. depression, see Weissman and Klerman (12)]. Nonetheless, the higher endorsement of reports of fatigue do not appear to be accompanied by increased reports of disturbed sleep per se. Although historical change in endorsement rates of MMPI items in general has been noted (8), the fact that reported fatigue appears to be increasing but reported insomnia is not suggests that the tiredness reported here may be related to insufficient time allotted to sleep, similar to the changes observed in other relatively healthy populations (7). Why women did not show this pattern is unclear, particularly inasmuch as a greater proportion of women have entered the work force relative to men over the intervening time. Perhaps this gender effect reflects another difference in how men and women previously reported fatigue-related symptoms, an effect still seen, to some extent, insofar as reports of snoring are concerned (13).

Although the contemporary sample was slightly older than the 1930s norming sample, this effect was largely due to the proportion of elderly individuals included in the 1980s sampling frame. Whether or not

this age difference had any bearing upon the historical differences observed is equivocal at best. Age differences in endorsement rates of individual items in the 1980s sample (8) suggested *lower* levels of fatigue with aging in some items (nos. 3, 41) and no age effects in several others (nos. 272, 505, 211). Only one item (no. 163) showed endorsement patterns suggesting that older subjects were more likely to be fatigued. Thus, whatever slight age differences may exist between the samples, they were unlikely to be responsible for the apparent historical change in endorsement rates that we have observed here.

These data corroborate the view that individuals living in American society may not prioritize sleep as important, and, as a consequence, may experience tiredness and fatigue. The emergence of a service-oriented economy offers with it the added temporal flexibility of work and leisure, but such change may occur at a high price insofar as sleep is concerned. At least among these upper Midwestern American men, the experience of fatigue is now either more prevalent or more readily endorsed than was the case in the Great Depression/pre-World War II era.

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