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# Men's Employment and Women's Sleep in South Africa

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*Abstract:*

There has been significant growth in research examining variation in quality and quantity of sleep across race, SES, and gender in the US. Less attention has been paid to the global South where high unemployment manifests in deleterious outcomes patterned by entrenched gender norms. We draw on South African Time Use Data from 2010 to 1) describe the variation in sleep quantity across employment status and gender; 2) examine the relationship between men's employment and women's sleep and 3) assess the extent to which women's employment moderates the effects. The findings suggest that women with unemployed partners have higher odds of experiencing oversleep compared to their peers with employed partners, whereas women in dual-earning couples are more likely to face sleep deficiency compared to women in male breadwinner arrangements. The results underscore the need to better understand the interaction of chronic unemployment and changing gender roles in a global context.

Keywords: Sleep, Gender, Employment, South Africa

## Men's Employment and Women's Sleep in South Africa

*Background*

Optimum sleep is critical for maintaining a healthy physical, mental and social life. Long been a subject of research in the biomedical sciences, it has been examined from a highly individualistic perspective (Espie 2002). Fortunately, there has been a surge of interest in the social sciences particularly with respect to gender differences. Women consistently report experiencing less sleep than men in surveys though much of this is explained through the lens of individual choice and behavior (Patlak 2005). Challenging this viewpoint, Dzaja et al. (2005) suggests that women's social roles and interactions should be considered as important factors as well as physiological aspects. Recent work in sociology has highlighted the link between sleep quality and work stress (Burgard and Ailshire 2009; Mai et al. 2019), marital relationship quality (Chen, Waite, and Lauderdale 2015; Meadows and Arber 2015), family relationship (Ailshire and Burgard 2012), and social ties (Maume 2013). We also have some evidence that employed mothers sleep less than unemployed mothers (Bianchi, Wight, and Raley 2005) particularly those who are engaged in shift-work (Kalil et al. 2014; Perrucci et al. 2007).

While we know a lot about how women's labor force participation impacts their sleep, there are two notable omissions in the scholarship. One, we know far less about effects at the couple level. Specifically, we do not know the extent to which employment status of her partners affects women's sleep. Two, nearly all the research on gender, employment and sleep has been conducted in western contexts even though employment related stressors are evident across the globe. To address these lacunae, we draw on South African Time Use data from 2010 to 1) describe the variation in sleep quantity across employment status and gender; 2) examine the

relationship between men's employment status and women's sleep quantity net of standard socio-demographic variables and 3) identify moderating effects of women's employment status. In this way, we hope to respond to Maume et al. (2010) who state that "At present, too little is known about the social antecedents and outcomes of sleep, and there is much that gender and family scholars can contribute to an understanding of an activity that constitutes one-third of our lives (Maume, Sebastian, and Bardo 2010: 765)."

South Africa is an ideal context for this study for several reasons. First, the country ranks as one of the most unequal countries in the world (World Bank 2018) driven, in large part, by unemployment which ranges between 27.6% and 38.0% depending on definition (Stats SA 2019) and is particularly acute amongst Black African men and women and youth (Banerjee et al. 2008; Kingdon and Knight 2004). Moreover, the unemployment rate has been rising and has remained above 20% for at least two decades (Bloomberg News 2020). Second, the country is undergoing a complex health transition in which both communicable and non-communicable diseases are present (Tollman et al. 2008) and in which sleep is getting more attention as an indicator of population health (Buysse 2014). Third, in the advent of apartheid's demise, the country has experienced significant shifts in gender roles with women (Dworkin et al. 2012; Morrell 2002; Richter and Morrell 2006) -- and particularly Black African women -- attempting to leverage new rights and opportunities. Taken together, the country offers a timely backdrop for examining how employment insecurity and contentious gender roles interact to manifest in sleep. Moreover, this works makes a much needed contribution to the sociology of sleep research by expanding the focus beyond the US and other western contexts. The focus on emerging economies such as South Africa is underscored by the need to better understand the health

implications of global shifts in economic arrangements, labor market conditions and gender scripts.

*The South African Context*

Even though there has been progress in terms of gender and racial inequality in post-apartheid South Africa, high unemployment is still gendered and racialized. The women's unemployment rate is higher than that of men, and the legacy of apartheid-era spatial separation based on race cost more for Black Africans[1] and Coloureds[2] than for Whites and Indians (Banerjee et al. 2008). Some research suggests that voluntary unemployment as one of the reasons for high unemployment in South Africa. However, Kingdon and Knight (2004) described that "households with a high proportion of unemployed persons are very substantially and significantly less satisfied with their quality of life than households with a high proportion of informally employed (Kingdon and Knight 2004)," which casts doubt on the voluntary unemployment idea. As a result, a large proportion of the population is forced to manage in the informal economy and rely on state provided poverty alleviation grants (World Bank 2018). In addition, in one of the few studies analyzing the psychological consequences of unemployment, de Witte, Rothmann, and Jackson (2012) show a relationship between unemployment and anxiety about financial matters, future uncertainty, and relational conflicts. Moreover, 96% of the unemployed respondents in the de Witte et al. study (2012) expressed that work is important because it provides meaning to their lives. Indeed, Budlender (2010) found that the share of time spent on unproductive work is much higher in South Africa compared to other countries, and that

[1] We retain the term "Black African" to be consistent with current-day usage in both academic and policy arenas.
[2] Coloured refers to mixed race

men contribute little to unpaid work in the household compared to women though unemployed men spend more time on domestic work than their employed counterparts.

Sleep research has become more prominent particularly in relation to health conditions such as HIV and non-communicable diseases (Gómez-Olivé et al. 2018) and obesity (Rae et al. 2018) and environmental conditions such as perceived safety (Hill et al. 2016). Other work has examined differences in sleep across gender. Szalontai (2006) analyzed the sleep demand using South African Time Use data from 2000, and found that average daily sleep duration is highest for Black African women and lowest for White men. However, an interpretation of sleep patterns as a function of economic incentives and household optimization does not fully account for the role of gender. Much of the scholarship on gender roles in the South African context draws attention to the continued dominance of the male breadwinner model in Black African families. It is a critical part of masculinity and fatherhood (Richter and Morrell 2006) and supports a gendered power dynamic favoring men (Boonzaier 2005). Men who are not able to do so are seen by their families and communities as powerless or without “amandla” (Hunter 2006). At the same time however, traditional gender roles are undergoing profound changes in the post-apartheid context as a result of shifts in educational attainment favoring women (Mantell et al. 2009), new labor market opportunities for women (Ntuli and Wittenberg 2013) and rights that have offered women (and men) new scripts to challenge traditional norms (Hunter 2010). Nonetheless, employment opportunities for Black African women continue to be limited even though the high unemployment rate for Black African men has made it necessary for women to earn money (Casale and Posel 2002; Floro and Komatsu 2011).

It is hardly surprising that the tension between competing scripts of gender roles amidst economic precarity and secular shifts in views on gender and family can manifest in conflicts

between partners (Strebel et al. 2006). Indeed much of the literature on gender based violence in South Africa -- sadly one of the highest in the world - points to men's emasculation in the public sphere as a contributing factor (Anderson and Umberson 2001; Boonzaier 2005; Moore 1994; Wood and Jewkes 2001) coupled with substance abuse (Gass et al. 2011; Jewkes, Levin, and Penn-Kekana 2002). Moreover, it has long been known that marriage rates among Black South Africans are some of the lowest in Africa (Hosegood, McGrath, and Moultrie 2009; Posel, Rudwick, and Casale 2011). This is in large part due to the disconnect between women's expectations of men and men's abilities to be consistent providers for women and children (Posel et al. 2011; Townsend, Madhavan, and Garey 2006). Far more common and perhaps preferable are informal unions that vary in living arrangements, strength and duration (Moore and Govender 2013; Sooryamoorthy and Makhoba 2016). Taken together, the shifts in the social, economic and political landscape are likely to manifest in sleep patterns for both women and men.

*Employment, Gender Roles and Sleep*

Williams and Bendelow (1998) describe sleep as socially patterned practices under a broad range of social structure and the influence of demographic factors, such as gender, race, and social roles including responsibilities and relationships inherent in our daily lives. While some people suffer hypersomnia (excessive sleep), defined as more than 10 hours of sleep (Hirshkowitz et al. 2015), a far greater number experience insomnia or insufficient sleep. Both conditions can have negative implications for physical and mental health (Buxton and Marcelli 2010) and can undermine work productivity and educational progress. It is a truism that sleep hours adjust to daily activities of which employment is, by far, the most prominent. We know that sleep problems have increased among full-time workers net of sociodemographic factors in the U.S. over the past three decades (Knutson et al. 2010). We also know that employment insecurity is

one of the biggest contributors to sleep disturbance for the general population in a range of contexts (Antillón, Lauderdale, and Mullahy 2015; Blanchflower and Bryson 2020; Kalousová, Xiao, and Burgard 2019). Burgard and Ailshire (2009) addressed work-related stress and sleep quality in the U.S and found that negative experience in the workplace is associated with poorer sleep quality. They also found an association between perceived job insecurity and poor sleep quality but caution that individuals who are actually in precarious situations may not recognize their insecurity until they lose their jobs. Therefore, there may be a lagged effect on sleep quality. Employment insecurity implies not only unstable employability coupled with the risk of being laid off but also uncertain prospects for promotion/advancement, earnings/income, and even the scheduling of work (Mai et al. 2019). These trends are also apparent in other global contexts. Mai and colleagues (2019) found an association between employment insecurity and sleep disturbance in 31 European countries. These negative effects are most likely brought about through increased stress for both the individual as well as family members and, in particular, partners. The mechanisms of these effects are clearly gendered.

Gender as a social structure (Risman and Davis 2013) forms our gendered identity, mode of social interaction, and social constraints and, therefore, is a key factor in understanding women's employment. Moreover, gender is a key element in understanding how social stratification conditions employment opportunities (Damaske and Frech 2016), how women manage work and family (Pedulla and Thebaud 2015; Percheski 2008) and the transition to parenthood in particular (Baxter et al. 2015; Drago, Wooden, and Black 2006; Killewald and Garcia-Manglano 2016). It is hardly surprising, therefore, that such differences manifest in sleep quantity and quality. For example, studies on work/family balance suggest that employed women sleep less than unemployed women in general because of the "double shift" of having domestic

responsibilities (Hochschild 1997). However, women's social position based on race, class, and type of occupation engender different sleep outcomes (Burgard 2011; Kalil et al. 2014; Lewis et al. 2013; Perrucci et al. 2007; Van Dyke et al. 2016). While these studies have advanced our understanding of women's work and sleep and, in particular, how intersectionality renders significant variation among women, we know far less about men's employment and women's sleep in the context of couples.

Expectations and communication within couples is a function of both societal norms of gender roles and the husband's gender attitude (Smith 1985; Spitze and Waite 1981). For example, the male breadwinner script accords paid employment responsibilities to men and domestic duties to women and privileges the former over the latter. This could explain why employed women spend more time in housework and caregiving even if they earn as much as their husbands (Bianchi et al. 2012; Perry-Jenkins and Gerstel 2020). Moreover, cultural norms might heighten expectations for employed women to practice intensive mothering which would explain why women prioritize family and men prioritize careers if given flexible work schedules (Gerstel and Clawson 2014). Even though husbands have increased their contribution to domestic work and child care over time, women are still the main caregivers and do most of the household work including planning, managing, and evaluating the work (Daminger 2019). Legerski and Cornwall (2010) posit that "pragmatic egalitarianism" is the dominant ideology among working-class couples in the U.S. While women's labor force participation has increases significantly both in the US and globally and men have increased their share of domestic labor, the division of household responsibilities is far from equal. (Goldscheider et al. 2015). Accordingly, it has been shown that women experience chronic strain from the stress of

balancing work and family, and face risk of psychological distress and depression. (Mianchi and Milkie 2010; Noor 2004)

The gender norms operating at the couple level can influence how each partner views the sleep needs of the other. Hislop and Arber's (2003) “gatekeeping” concept suggests that women are very concerned about their husbands’ sleep. In other words, women believe that their husbands -- as the primary breadwinner-- are entitled to longer and better quality sleep for recuperating and performing at work. Another good example of a couple-based approach is Killewald and Garcia-Manglano's study (2016), which shows that men's working hours and household work are relatively fixed while women's time allocation varies much more. Finally, in their study of 23 European countries, Maume, Hewitt, and Ruppanner (2018) found that women's sleep quality is affected by both childcare and partner's unemployment, whereas men are mainly impacted by unemployment and financial issues. Indeed, these patterns are so entrenched that women have come to accept that it is their responsibility to keep the household functioning -- even if they are gainfully employed -- and therefore will need to sacrifice sleep.

In this paper, we focus on the relationship between men’s employment status and women’s sleep. Under the male breadwinner norm in which men are expected to work, men’s unemployment can be a major source of stress both psychologically and financially for women. Alternatively, using a “pragmatic egalitarian” model (Legerski and Cornwall 2010) in which both partners are working, the men’s domestic work contributions may be so limited that women’s sleep suffers. At the same time, the women’s employment may moderate the effect of men’s employment status because of additional income. However, employed women are more likely to experience a double burden of household work and economic activity leading to even less sleep. If both partners are unemployed, stress from employment insecurity and financial

instability could exacerbate sleep quantity and quality for both partners and, in particular, women. Bringing together our understanding of gendered expectations within couples with changing scripts of gender roles in employment and domestic chores, we offer the following schema showing both mediating and moderating effects

Insert Figure 1 here

Men's employment status may affect women's sleep directly through stress from financial precarity and unmet breadwinner expectations. Alternatively, division of domestic work in the household may play a mediating role. For example, employed men operating under male breadwinner norms are likely to expect their partners to do all the household work regardless of women's employment status which, in turn, may result in sleep deficiency. However, if the man takes a more active role in domestic work, she may be able to maintain recommended sleep. Women's employment can play a moderating role on the effect on women's sleep. If the woman is employed, she may be more likely to experience sleep deficiency due to the double burden of work and domestic chores. This might be even more heightened if she is the sole breadwinner in the couple.

*Data and Methods*

The data for this analysis come from the Multi Country Time Use Studies (MTUS) archived through IPUMS (https://www.mtusdata.org/mtus/). The 2010 South African Time Use data is a nationally representative sample of 39,018 respondents aged 15-64. Because we are interested in couple level dynamics, we created a couple level dataset (N=2,339) and draw on individual data for both partners. Furthermore, we restrict the sample to ages 20-59 for either partner to account for late completion of school and the onset of pension at age 60.

According to the National Sleep Foundation (Hirshkowitz et al. 2015), the recommended hours of sleep for adults aged 26-64 is 7 to 9 hours with 6 and 10 hours being the absolute extremes. The American Academy of Sleep Medicine recommendations for adults aged 18 and older is 7-8 hours. Our sensitivity tests using different categorizations produced similar results. Therefore, we opted for the wider range in order to highlight the link between employment and sleep more clearly. Our main outcome variable is a three category measure: recommended sleep (6-10 hours), deficiency (< 6 hours) and over sleep (> 10 hours). We used the Statistics South Africa **(**STATS SA) definition of 'employed' which refers to persons aged 15-64 who, during the reference week, *did any work for at least one hour*, or had a job or business but were not at work. Conversely, 'unemployed' is defined as those who *were not employed in the reference week, and actively looked for work or tried to start a business* in the four weeks preceding the survey interview, and *were available for work*, or had not actively looked for work in the past four weeks but had a job or business to start at a definite date in the future. In this study, the 'not economically active' category is combined into the unemployed category because prolonged high unemployment situations usually discourage job seekers.

We start with bivariate analyses showing the relationship between women's and men's employment status and women's sleep. Second, we conduct multinomial logistic regression models to examine the association between men's employment status and women's sleep controlling for age, education, race, region, type of residence, type of day reporting time use of both partners as well as women's employment status, household size, the proportion of household made up of children and number of elders. To show the mediating effect of domestic work hours of men and women, we run separate models with and without these variables. In addition, we run models restricted to couples with only employed men to examine the effect of

income and occupation type net of the same controls. Lastly, to examine the moderating effect of women's employment on the relationship between men's employment and women's sleep, we develop a joint employment status variable categorized as follows: man employed/women unemployed (male breadwinner model), men unemployed/women employed (female breadwinner model), both employed (dual earner) and both unemployed.

*Results*

Table 1 presents selected descriptive statistics of the sample and key variables of interest.

Insert Table 1 here.

In terms of sleep, women have on average about 25 minutes more than men and more women experience too much sleep compared to men whereas more men are subject to too little sleep. Based on the International Standard Classification of Occupations (ISCO) codes, men are more represented in professional/managerial positions whereas women are overrepresented in industrial/service positions. According to the couple employment distribution, dual-earning couples are the most prevalent form closely followed by arrangements in which men are employed but women are not. Men are slightly older than women, but the educational attainment distribution is similar with the majority entering secondary school and about 27% completing secondary education. The largest race group is Black African as expected followed by White and the vast majority live in urban formal areas and about 20% in rural communities. We now examine bivariate relationships between employment status of women (Figure 2) and men (Figure 3) and sleep.

Insert Figures 2 and 3

Unemployed women are more likely to be found in the "over sleep" category compared to employed women though the majority in each group appear to have recommended sleep. Women whose partners are unemployed are also more likely to experience oversleep compared to women whose partners are employed. This is consistent with previous work that shows that women spend more time on sleep than men in South Africa (Szalontai 2006). Table 2 presents results of multinomial logistic regression models examining the relationship between men's employment status and women's sleep net of partner's socio demographic variables. To better understand the role of domestic work, we present models without (1) and with (2) domestic work hours.

Insert Table 2 here

Women whose partners are unemployed are more likely (RRR 1.26) to experience oversleep compared to women whose partners are employed net of women's and household characteristics. Women who are employed are less likely (RRR 0.32) to experience oversleep compared to unemployed women. In addition, given a one unit increase in household size, the relative risk of experiencing oversleep decreases by 20%. When we include domestic work hours of both partners in Model 2, the men's employment effect disappears pointing to a mediating effect. Moreover, we find that his domestic hours has no effect but her domestic hours has a strong positive effect on the relative risk of experiencing sleep deficiency. It is also notable that the effect of women's employment gets stronger suggesting that women who work are not relieved of their domestic chores resulting in sleep deficiency. We now examine whether men's occupation type and income help explain variation in sleep for women with employed partners.

Insert Table 3 here

As income increases, the odds of experiencing oversleep decreases but the effect is very weak. There is no effect of type of occupation. The effects of women's employment and domestic work hours are similar to those in Table 2. Employed women are less likely (RRR 0.19) to experience oversleep and more likely (RRR 2.03) to experience sleep deficiency compared to unemployed women. An hour increase of women's domestic work hours lowers the relative risk of being in the oversleep by about 12% but has no significant effect on sleep deficiency. To better understand the extent to which women's employment moderates the effect of men's employment, we turn to Table 4 that includes a joint employment status as the main explanatory variable.

Insert Table 4 here

These results indicate that employed women whose partners are unemployed are significantly less likely to experience oversleep than women in male breadwinner couples but, interestingly, are not more likely to experience sleep deficiency. Women in dual earner couples are two times more likely to experience sleep deficiency compared to women in male breadwinner couples and 20% less likely to experience oversleep. This suggests that women in dual-earning couples may have less sleep due to the double burden of work and family obligations. However, employed women with unemployed partners do not face higher odds of sleep deficiency possibly due to men assuming a larger share of household chores net of her total hours of domestic labor.

## *Discussion*

In this paper, we addressed an understudied topic -- the relationship between men's employment status and women's sleep - in a non-Western context. Our results show that women are more

likely to experience oversleep (hypersomnia) than sleep deficiency, a notable departure from the extant literature from the US and western contexts which has mostly focused on sleep deficiency. Both are problematic and symptomatic of stress, anxiety and can lead, if left unchecked, to deleterious physical and mental health outcomes. We also found that 1) men's unemployment is associated with women experiencing oversleep; 2) some of this is driven by domestic work chores that are usually taken on by women; 3) neither men's income nor type of profession has any effect on women's sleep; and 4) women in dual earner couples face an increased risk of experiencing sleep deficiency but, interestingly, women who are the sole earners do not.

The interpretation of these findings needs to be situated in the broader social and economic landscape of South Africa. First, our findings are consistent with previous work on sleep in South Africa in that sleep problems are part of the complex health transition under way that includes both infectious diseases such as HIV/AIDS and communicable diseases such as diabetes. Rather than pathologizing oversleep by invoking personal choice explanations (e.g. boredom), it would be more fruitful to consider the structural factors that result in such patterns with perhaps the most important being employment. South Africa's exceedingly high unemployment rate is debilitating to individuals, partners and families through the direct effects on financial resources, food and other necessities of survival and perhaps even more insidious, effects on mental health through increased stress and shame particularly for men who are expected to be breadwinners. Furthermore, the lack of any effect of income or type of profession for employed men is even more telling of the rigidity of the labor market that leaves only a limited set of employment possibilities particularly for Black African men.

In addition to political economy, both men and women are grappling with seismic shifts in gender roles and concomitant expectations. On one hand, women and particularly Black

African women have embraced the chance to pursue educational and employment opportunities in the wake of the apartheid's demise. Indeed the returns to education are higher for women than men (Salisbury 2016). Moreover, women's income is critically needed for households to survive. However, this does not mean that traditional gender roles expectations i.e. men working/women engaging in domestic chores have disappeared. In our results, men's domestic work contribution does not affect women's sleep hours. At the same time, however, the proportion of dual earning couples is as large as male-breadwinner couples and educational attainment is fairly similar between men and women. Although it needs further research, we suspect that gender role expectations at the couple level continues to be a contentious issue exacerbated by the climate of high unemployment and insecure employment. Our findings suggest that strain at the couple level may manifest in unhealthy sleep for women.

Our analysis has important limitations. Firstly, by focusing on sleep quantity, our ability to capture more nuanced effects on sleep is limited. For example, even though women in female breadwinner couples did not show sleep deficiency, we cannot see the impact on quality of sleep. In addition, the data set did not have a direct measure for stress and relationship quality, which is relevant for sleep quality among married couples (Chen et al. 2015). Third, our data is cross-sectional with no sense of timing of events, duration of sleep patterns, and duration /change of employment status, whereby introducing endogeneity concerns. Selectivity issue of sample also arises such that couples whose unions dissolved because of unemployment challenges are not in the sample. Therefore, our models may underestimate the effects of men's unemployment on women's sleep.

Despite these limitations, we believe our analysis has advanced our understanding of gender, employment and sleep by focusing attention on the couple level. Moreover, by extending

the research to non-western contexts, we have brought attention to global trends in the nature of work, employment (in) security and changing gender roles, all of which can manifest in alterations to sleep quantity and quality.

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Table 1: Selected Sample Characteristics

| | Men | Women |
|---|---|---|
| Mean total sleep (minutes) | 525.2 | 549.9 |
| Recommended sleep | 50.2% | 46.9% |
| Too little sleep | 11.9% | 6.6% |
| Too much sleep | 37.9% | 46.4% |
| Employment status | | |
| Man employed/woman unemployed | 41.3% | |
| Man unemployed/woman employed | 6.4% | |
| Both employed | 42.2% | |
| Both unemployed | 10.1% | |
| Mean age | 38.4 | 34.2 |
| Educational attainment | | |
| Less than primary completed | 11.4% | 9.7% |
| Primary completed | 5.3% | 5.1% |
| Secondary not completed | 37.5% | 39.2% |
| Secondary completed | 27.3% | 27.7% |
| Tertiary | 18.5% | 18.4% |
| Race | | |
| Black African | 71.1% | 70.4% |
| Coloured | 11.8% | 12.4% |
| Indian | 3.0% | 2.9% |
| White | 14.2% | 14.3% |
| Type of residence | | |
| Urban formal | 67.6% | |

| | |
|---|---|
| Urban informal | 10.5% |
| Rural | 21.9% |
| | |
| N (couples) | 2,339 |

Table 2: Men's Employment Status and Women's Sleep

| | Model 1 | | Model 2 | |
|---|---|---|---|---|
| | Sleep deficiency vs. recommended sleep | Oversleep vs. recommended sleep | Sleep deficiency vs. recommended sleep | Oversleep vs. recommended sleep |
| Man unemployed | 1.32 (.50) | 1.26 (.17) + | 1.33 (.52) | 1.16 (.16) |
| Woman employed | 1.41(.42) | 0.32 (.04) *** | 1.75 (.58) + | .23 (.03) *** |
| Man's domestic work hours | n/a | n/a | 1.03 (.07) | 1.02 (.03) |
| Woman's domestic work hours | n/a | n/a | 1.09 (.05) + | .89 (.02) *** |
| Household size | 1.02 (.12) | 0.80 (.04) *** | 1.02 (.12) | .82 (.04) *** |
| Proportion of household < age 7 | 1.10 (.83) | 1.06 (.28) | 0.85 (.67) | 1.42 (.38) |
| N | 2,339 | 2,339 | 2,339 | 2,339 |

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1 (two-tailed)
All models control for race (Black African, Colored, Indian, White), age, education, region, urban, number of elderly, typical day (1. yes 2. No, I was ill 3. No, it was school holidays 4. No, I was on leave from work 5. No, funeral, wedding, bereavement 6. No, problem with the weather 7. No, looking after another family/house).

Table 3: Men's Occupation Type/Income and Women's Sleep

| | Sleep deficiency vs. normal sleep | Over sleep vs. normal sleep |
|---|---|---|
| Man's income | 1.05 (.07) | 0.95 (.02) + |
| Occupation (ref: agriculture ) | | |
| Professional/managerial | 1.47 ( .72) | 0.90 (.21) |
| Industrial/army | 0.85 (.32) | 0.92 (.13) |
| Woman employed (ref: woman unemployed) | 2.03 (.77) + | 0.19 (.03) *** |
| Man's domestic work hours | 1.02 (.08) | 1.06 (.04) |
| Woman's domestic work hours | 1.09 (.06) | 0.88 (.02)*** |
| Household size | 0.98 (.15) | 0.83 (.05) ** |
| Proportion of children (<7yr) | 1.25 ( 1.03) | 1.77 (.53) + |
| N | 1,883 | 1,883 |

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1 (two-tailed)
All models control for race (Black African, Colored, Indian, White), age, education, region, urban, number of elderly, typical day (1. yes 2. No, I was ill 3. No, it was school holidays 4. No, I was on leave from work 5. No, funeral, wedding, bereavement 6. No, problem with the weather 7. No, looking after another family/house).

Table 4: Joint Employment Status and Women's Sleep

| | Sleep deficiency vs. normal sleep | Over sleep vs. normal sleep |
|---|---|---|
| Joint Employment Status | | |
| Man employed/ woman unemployed | Ref | Ref |
| Man unemployed/ woman employed | 1.99 (1.18) | 0.35 (0.08)*** |
| Both employed | 2.00 (0.73)+ | 0.20 (0.03)*** |
| Both unemployed | 1.89 (0.99) | 0.98 (0.16) |
| Man's domestic work hours | 1.03 (.07) | 1.02 (.03) |
| Woman's domestic work hours | 1.09 (.05) + | 0.89 (.02) *** |
| Household size | 1.02 (0.12) | 0.82 (0.04)*** |
| Proportion of children ( <7yr) | 0.86 (0.68) | 1.44 (0.39) |
| N | 2,339 | 2,339 |

*** p<0.001, ** p<0.01, * p<0.05, + p<0.1 (two-tailed)

All models control for race (Black African, Colored, Indian, White), age, education, region, urban, number of elderly, typical day (1. yes 2. No, I was ill 3. No, it was school holidays 4. No, I was on leave from work 5. No, funeral, wedding, bereavement 6. No, problem with the weather 7. No, looking after another family/house).

Figure 1.

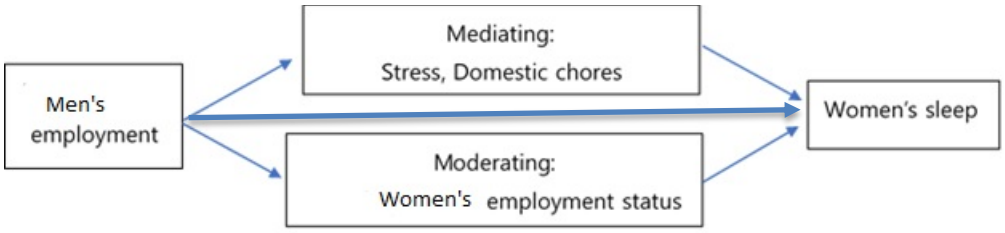
Mediating:
Stress, Domestic chores
Men's employment
Women's sleep
Moderating:
Women's employment status

Figure 2. Women's Sleep by Women's Employment Status.

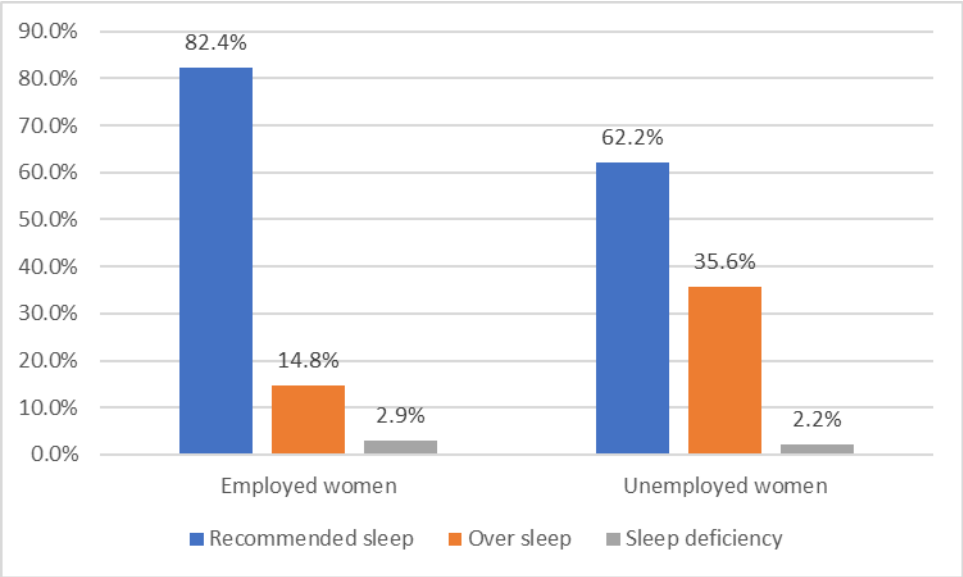

Figure 3. Women's Sleep by Men's Employment Status