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Domestic workload and multiple roles

Epidemiological findings on health and sickness absence in women

by
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ABSTRACT

Aim
The objective of this thesis was to analyse the importance of specific exposures in women's lives to health and sickness absence; more precisely to study the association between domestic work, multiple roles and the experience of being sick-listed, and self-rated health, psychiatric disorders and sickness absence.

Method
The thesis was based on two datasets. 'Women's health and living conditions' (WHL) is a cross-sectional study on 1 417 employed women aged 17 to 64 years old. Data was collected with a questionnaire, and register and employee data on sickness absence. 'Women and alcohol in Göteborg' (WAG) is a prospective cohort study on 1 799 women in eight age cohorts born from 1925 to 1980. Data was collected with a screening questionnaire, interviews and register-based sickness absence. Several aspects of domestic work, multiple roles and experience of sickness absence were analysed in relation to self-rated health (SF-36), psychiatric disorders (DSM-III and IV) and sickness absence. The study on multiple roles emanated from the role strain and role enhancement hypotheses and roles were analysed as single roles and as combinations of roles. Changes in self-rated physical health were assessed in relation to experience of sickness absence over five year. Cross-sectional and longitudinal analyses were conducted using multivariate regressions analyses.

Results
Domestic job strain and a lack of domestic work equity and marital satisfaction were associated with lower self-rated health particularly vitality and mental health. The former was not associated to sickness absence, but the latter was. Women with domestic workload due to children and adults with special needs had higher odds for medium-long sick-leave spells, while parental responsibility gave lower odds for any sick-leave spell. Occupation was related to lower odds for poor self-rated physical health and sickness absence, while the parental role was associated with higher odds for sickness absence. Compared with women who had all three roles women with occupation and partner role had lower odds for negative health outcomes. Support was found for the role strain hypothesis in the cross-sectional analyses of role combinations while neither of the hypotheses was supported in the five year follow up. A lower proportion of those who had experience of being sick-listed reported good health at both baseline and follow up. Women with psychiatric disorders had higher odds for a change from poor to good self-rated physical health over the five years if they had been sick-listed.

Conclusion
Domestic workload was associated to health and sickness absence in women, but there were inconsistencies in the findings on children and being a parent and on multiple roles. From a public health perspective, deeper knowledge on the importance of women's engagement domestic work and its different dimensions is important for promoting women's health. A multidimensional assessment of domestic work is important and the content and complexity of domestic work and of different roles needs to be further explored in relation to health and sickness absence in women.

Keywords
Domestic work, domestic workload, multiple roles, sickness absence, psychiatric disorders, self-rated health, women

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SAMMANFATTNING

Syfte

Avhandlingens syfte var att undersöka sambandet mellan olika former av belastning i kvinnors liv med hälsa och sjukfrånvaro; mer specifikt var syftet att studera sambandet mellan hem- och familjearbete, olika sociala roller samt erfarenhet av sjuskrivning i förhållande till självskattad hälsa, psykisk sjukdom och sjukfrånvaro.

Metod

Avhandlingen baseras på två olika databaser: 'Kvinnors hälsa och levnadsvillkor' (KHOL), en tvärsnittstudie baserad på enkät och med uppgifter om sjukfrånvaro från Försäkringskassans register och från arbetsgivare för 1417 yrkesverksamma kvinnor i åldrarna 17-64 år. 'Kvinnor och alkohol i Göteborg' (WAG) är en prospektiv kohortstudie bland kvinnor i åtta födelsekohorter från 1925 till 1980 (n=1799), baserad på screening, intervjuer, information om psykisk sjukdom (DSM-III och IV) och registerbaserad sjukfrånvaro.

Flera aspekter av hem- och familjearbete, olika roller och erfarenhet av sjukskrivning analyserades i relation till självskattad hälsa (SF-36), psykisk sjukdom och sjukfrånvaro. Både tvärsnitts- och longitudinella studier genomfördes med multivariat regressions analys.

Resultat

Kvinnor som rapporterade en högre belastning i hem- och familjearbete respektive rapporterade en bristande jämlik fördelning av hemarbetet och var mindre nöjda med parrelationen hade en lägre självskattad hälsa i synnerhet för vitalitet och psykisk hälsa. Fördelning av hemarbete och hur nöjd man var med parrelationen hade också ett samband med högre sjukfrånvaro. Kvinnor med omsorgsansvar för barn eller vuxna med särskilda behov hade en högre sannolikhet att ha medellånga sjukfall, medan generellt föräldraansvar var associerat till en lägre sannolikhet för sjukfall. Kvinnor som arbetade eller studerade hade en lägre sannolikhet för dålig självskattad fysisk hälsa och för sjukfrånvaro, medan föräldrarollen var associerad till högre sannolikhet för sjukfrånvaro. Kvinnor som arbetade och hade en partnerroll hade lägre sannolikhet för sämre hälsa och sjukfrånvaro i jämförelse med de kvinnor som arbetade, hade en partnerroll och också var förälder. Tvärsnittsanalyser av rollkombinationer gav stöd för rollstresshypotesen men vare sig rollstress eller rollexpansions hypotesen fick stöd i en femårsuppföljning. En lägre andel av de kvinnor som hade erfarenhet av sjukskrivning rapporterade god självskattad fysisk hälsa vid både baslinjeundersökningen och vid uppföljningen fem år senare. Kvinnor med psykisk sjukdom hade högre sannolikhet för att rapportera en förändring från dålig till bra hälsa vid uppföljningen fem år senare om de hade varit sjukskrivna.

Slutsats

Det fanns ett samband mellan ett flertal aspekter av hem och familjearbete och hälsa och sjuskrivning hos yrkesverksamma kvinnor. Sambanden med olika roller var mer varierade liksom betydelsen av att ha barn och av att vara förälder och några säkra slutsatser är svåra att dra. Ur ett folkhälsoperspektiv är en ökad kunskap kring hur kvinnors hälsa påverkas av hem och familjearbete viktig för att kunna utveckla förebyggande och hälsofrämjande åtgärder. För att studera betydelsen av hem och familjearbete för kvinnors hälsa och sjukfrånvaro är en flerdimensionell ansats viktig liksom en detaljerad kunskap om innehållet i olika roller och rollkombinationer.

Nyckelord: Hem och familjearbete, arbetsbelastning, multipla roller, sjukskrivning, psykiatrisk sjukdom, självskattad hälsa, kvinnor

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ORIGINAL PAPERS

This thesis is based on the following papers, which will be referred to in the text by their Roman numerals.

I. Staland-Nyman C, Alexanderson K, Hensing G
Associations between strain in domestic work and self-rated health: A study of employed women in Sweden

Scandinavian Journal of Public Health, 2008; 36:21-2

II. Staland-Nyman C, Alexanderson K, Hensing G
Sickness absence in women – what are the associations with different aspects of domestic work?

Submitted

III. Staland-Nyman C, Spak L, Hensing G
Occupation, partner and parent: what are the associations of single and multiple roles with self-rated physical health, psychiatric disorder and sickness absence in women?

Submitted

IV. Staland-Nyman C, Andersson L, Spak F, Hensing G
Exploring consequences of sickness absence – a longitudinal study on changes in self-rated physical health

Accepted for publication in WORK: A Journal of Prevention, Assessment and Rehabilitation

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1. INTRODUCTION

From a public health perspective women's health is cross-cultural an issue of major importance [1]. Epidemiological studies have shown that women compared with men report worse self-rated physical and mental health [2-5], have a higher prevalence of psychiatric disorders [6] and a higher rate of sickness absence [7], while mortality and health hazards owing from lifestyle factors being more pronounced in men [8, 9]. In short, women are sicker during their lives but live longer than men. Health differences between women and men are a concern also in a welfare state such as Sweden; differences in sickness absence have been much discussed and are still not completely explained [5, 7, 10, 11]. Overall the reasons behind gender differences in health are multifactorial: biological, social and cultural factors do contribute [7, 12-14]. Still there is a need to explore these differences further. Studies on specific exposures in women's lives can be a way of moving the knowledge a bit foreword. The focus of this thesis is the contribution of domestic work, multiple roles and experience of being sick-listed, and how these factors are associated to self-rated health, psychiatric disorders and sickness absence in women.

Domestic work is of importance for the individual as well as for society, and the nature of domestic work has similarities across nations, although shaped by cultural context. The division of domestic work by gender is also profound in most societies, with women conducting the majority of this work assessed as hours spent [15-17]. Furthermore the content of the domestic work is complex, and the context in which this work is carried out is diversified, loaded with symbolic and cultural meanings and emotional ties [18].

Earlier research, on the importance of domestic work for women's health, has mainly focused on the importance of paid and unpaid work taken together or the interface between these parts of work. The separate impact of the domestic work has less often been analysed, and the need for such research has been stressed [17, 19].

Despite the profound changes in women's role in the paid labour force, the roles in the domestic arena have remained fairly consistent in that women often still have greater responsibility for domestic work [16, 20]. From a Swedish public health perspective, the relationships between multiple roles (occupational, partner and parent) and women's health are interesting due to the cultural context of gender equity [21]. Multiple roles have also been suggested as part of the explanation women's higher sickness absence [7, 22].

In most societies where women are part of the paid labour force to almost the same extent as men, women also have higher rates of sickness absence than men [7, 23-26]. In Sweden the sick-leave rate in women increased in all age groups from 1990, with the largest increase for women of 20 to 39 years of age and for women in the public sector [22, 27]. Since women are exposed to sickness absence more often than men, the sick-leave period itself could also be regarded as a specific exposure more profound in women. Few studies, however, have addressed the possibility that the sick-leave period itself could be regarded as an exposure with possible positive or negative consequences for subsequent health.

2. BACKGROUND

2.1 Women's work

Paid labour force participation by women has increased steadily during the last decades [20, 28], and Swedish women have the highest labour force participation rate in Europe, especially with regard to women with dependent children [28]. The work pattern for the distribution of number of worked hours in paid and unpaid work per week differs between the sexes [16, 17, 28]. The total amount of worked hours per week is similar for women and men in Sweden, with an average of 51 worked hours per week in the age group 20 to 64 years in 2000/2001. The time spent in paid work was 22 hours a week for women and 30 hours a week in men, and women work part-time to a larger extent than men. As regards unpaid work the position was inverted, with women working on average 29 hours a week and men 21 hours a week [29]. As in paid work, women's worked hours in unpaid work vary considerably over life stage, and civil and family status [15]. Parallel with women's higher participation rate in the paid labour force the weekly hours devoted to household work have slightly decreased over the last decades in Sweden (i.e. from 1970 to 2000), while there has been a smaller increase in men's weekly hours. Research from several countries gives evidence that women still do the majority of domestic work [16, 21, 30], and that this pattern is also found in Sweden despite the cultural context of gender equity [21, 31, 32]. This gender difference has also been found to increase with the number of children living at home [29, 32, 33].

Doyal (1999) has concluded that domestic work is the most 'gendered' form of labour [34], and in a Swedish study it was pointed out that 'housework is not a gender-neutral work even in Sweden' [21].

Current definitions of work derive in a tradition that equates work with production of goods or services generating income [35]. This way of defining work, makes the domestic work invisible. In many respects daily domestic work has been taken for granted and its invisibility consequently reinforced. Since domestic work has low status and is mainly performed behind 'closed' doors, attention has been distracted from possible hazards [34]. In research on paid work, physical loading and psychosocial work environment, the balance between demands and control over work situations and other potential hazards for health have been examined [36]. Sweden has for example a national-wide register for work-related diseases and accidents to paid work, as well as legislation for the working environment, but less is known about prevalence and incidence of illness/disease and risk factors related to domestic work where women spend a large part of their lives [34].

2.2 Domestic work – a complex phenomenon

Terms used to describe domestic work have varied, and examples are: unpaid work, household work, housework, domestic labour, domestic demands, domestic workload and domestic responsibility. So far domestic work research has also been characterised by the lack of a formal definition. According to Coltrane (2000), the concept of housework or household labour is rarely defined explicitly, except in planning how variables are measured [37]. In health research many studies performed have been departed from available indicators rather than theoretical definitions.

Work is, however, a complex activity which can be difficult to measure even if the work situation is formally well defined and takes place on a certain worksite. Domestic work tasks vary from person to person, with different life stages, and they also include physical, emotional and contextual factors. Recurrent tasks also

have to be carried out in a context where individuals are linked together by both practical and emotional dependencies, and in a shifting pattern of social relations [18]. Taken together, all these factors makes it difficult to clearly describe the content of the domestic work and what types of work tasks is of importance to measure in health research. For the domestic work there are no well developed framework or instruments as for paid work, and the dimensions of domestic work are not clearly identified [38].

Several types of measurements on domestic work have earlier been used. Following measurements are a selection in order to show different types of measurements used in earlier health research: children [39, 40], domestic working hours [41, 42], working hours in and responsibility for various household duties and child care [32], participation in domestic work [43], housework and childcare [44], division of domestic work between partners/cohabiters [45, 46], number of dependent persons [47] and control at home (intended meaning: feelings of having control over what happens in most situations at home) [48, 49].
Within the above-mentioned measurements the content referring to what work tasks were included was varying.

The importance of a more comprehensive way of measuring the domestic work has been stressed in order to describe and assess the complexity of the domestic work [17, 50], and as suggested by Walters [19], surveys need to go beyond measures of time spent and measure the content, components and character of women's domestic work. In earlier research originating from the social sciences some classifications have been made which try to grasp different aspects of this work such as inside versus outside domestic work tasks [51], daily versus non-daily [52], high schedule-control versus low schedule-control [53] and routine versus occasional tasks [37].

A point of departure of this thesis has been the complexity of domestic work consisting of physical, emotional and contextual factors. In the section below (section 7.7), lessons learned from the different studies performed will be summarised and discussed both regarding possible ways of operationalising domestic work and describing its content.

In the next section measurements and operationalisations, previously used within health research, and results in relation to health and sickness absence will be presented.

2.3 Paid and unpaid work: the interface and its importance for health and sickness absence

As mentioned above, earlier health research have foremost focused the paid and unpaid work taken together or the interest have been in to scrutinize the importance of the interface between these two arenas, fig 1.

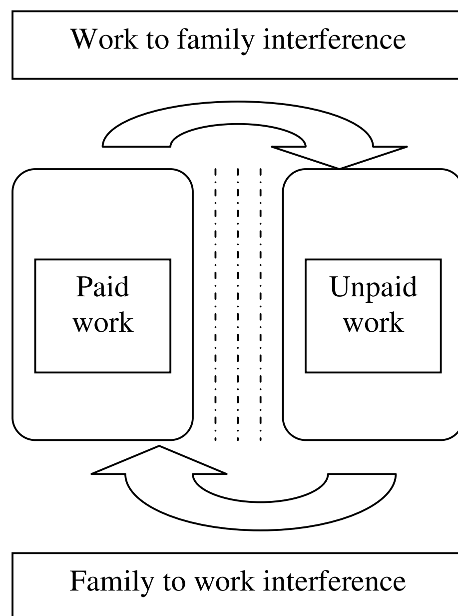

Figure 1. A model of the interplay between paid and unpaid work

In research on paid and unpaid work taken together, operationalisations such as double exposure [54, 55], and total workload [32, 56], have been used. A large amount of workload in both paid and unpaid work has been associated with several negative health outcomes such as shoulder and neck pain, headache, sleeping problems, high blood pressure, fatigue, psychosomatic strain and low self-rated health [54, 56-60]. Krantz and colleagues found in a study on women aged 40 to 50 years of age that a combined exposure of both a high level of job strain and

domestic responsibility increased the odds for common symptoms, such as headache, tiredness, muscular tension, irritability and nervousness or anxiety [55]. Another focus in research has been the interface between paid and unpaid work (Figure 1), where the two parts of work are regarded as reciprocating domains with potential intrinsic and conflicting demands or expectations [61]. Conflicts can originate from either domain, with work interfering with unpaid work (i.e. family) or unpaid work interfering with paid work [61]. In a study on registered nurses in US, every second reported chronic work interference with family compared with 11% reported family interference with work [62]. Both cross-sectional and longitudinal studies have found that a lack of fit in the interface between paid and unpaid work was associated with adverse health outcomes such as poor self-rated health, psychological distress, musculoskeletal pain and fatigue [63-67]. Frone and colleagues found in a prospective study over four years that family/work conflict was related to elevated levels of depression, poor self-rated physical health and to incidence of hypertension in a sample of employed parents [68]. Researchers have also hypothesised that women experience more interference between the two areas of work than men because of their often greater responsibility for unpaid work. Studies, however, has shown inconsistent results for this hypothesis. In some studies, gender differences were present [69], whereas in others no difference was found [70], or the interference was found to affect men more than women [71].

In relation to sickness absence, a high amount of total workload in paid and unpaid work and conflicting interference between these two parts has been found to be of importance [42, 43, 69, 72]. In a French prospective study on psychiatric sickness absence, women and men exposed to high levels of work and family demands had higher rates of sickness absence owing to non-psychotic psychiatric disorders [73]. In a Dutch study it was found that the average number of sick-leave days over a six-month follow-up period was almost four days higher in women with high

versus low work-home interference, after controlling for age and long-term disease [74]. In a study of white-collar employees in Sweden aged 32 to 58 years, however, conflicting demands between home and work did not emerge as a risk factor for sickness absence for women, but only for men [71].

2.4 Domestic work – associations to health and sickness absence

Scientific knowledge of the separate impact of domestic work on health and sickness absence is much less developed. In a Whitehall II study, women with low control at home ('At home, I feel I have control over what happens in most situations') showed 2.6 higher incidence rate of coronary heart disease (CHD) also after adjustments for age, household social position, financial problems and CHD risk factors (blood pressure, diabetes, smoking, exercise and obesity) compared to women who reported high control at home in that study [48]. Griffin and colleagues (2002) found that both women and men reporting low control at home had higher odds for suffering from depression and anxiety [75].

In a prospective Finnish cohort study, long domestic working hours (>25 per week) were associated with higher rates of medically-certified sickness absence (> 3 days) for both women and men [41]. Väänänen and colleagues, found that among full-time municipal employees long domestic working hours (>50 hours/week) were associated with higher sickness absence in men but not in women [42].

When the importance of responsibility for domestic work was analysed in relation to sickness absence neither Vingård and colleagues [76], nor Voss and colleagues [43], found an association with employed women in general. For the subgroup of married or cohabiting women with children at home and a high domestic workload, however, Voss and colleagues did find a higher incidence of sickness absence.

With regard to domestic work, the degree of division of this work between partners or perception of equity in this division has been analysed [46].

In a qualitative study by Östlund and colleagues, perceived equity in domestic work and the quality of the relationship with one's partner were important factors for return to work after sickness absence [77], and Bird (1999) concluded that perception of 'inequity in the division of household labour has a greater impact on distress than does the amount of household labour [78].

For domestic work operationalised as number and/or age of children in the family the results in relation to sickness absence have been inconsistent [39, 40, 79, 80]. In a systematic review by the Swedish Council on Technology Assessment in Health Care, no scientific evidence regarding the association between children and sickness absence was found and a need for more research within the domestic area was stressed, not least studies with a gender perspective [24].

To have children, also mean a parental role. Another exposure in women's lives is the one of simultaneous holding of several social roles (i.e. occupation, partner and parent) and the possible conflicts which might be embedded in this situation.

2.5 Multiple roles and the role strain and role enhancement hypotheses

Research on multiple roles focused initially on what was called women's nurturing roles as a mother and spouse. In the 1980s the concept was extended to cover occupational, marital and parental roles [81], and in health research these three roles have been examined in various ways.

Two contradicting hypotheses have been put forward regarding the concept of multiple roles: the 'role strain' and 'role enhancement' hypotheses. According to the 'role strain' hypothesis, multiple social roles imply increased demands and conflicting expectations between roles [82]. Based on the notion that each person has a limited source of energy and time, this situation could, in the long run, result in stress-related symptoms and lowered psychological well-being [83-85]. This perspective emphasises the costs rather than the benefits for the individual, and multiple roles are argued to be more stressful for women than men because women take on different roles over and above their often greater responsibility for domestic work [86]. The 'role enhancement' hypothesis suggests, on the other hand, that there are benefits to be gained through accumulation of social roles [87]. To have multiple roles such as being an employee, a partner and a parent could provide women with increased access to economic resources as well as different types of social support, and attachment to multiple roles may also lessen distress owing to loss or strain in another social role. All these factors could imply a positive influence on health [86]. Overall, fairly consistent empirical results have found a positive effect on general health and psychological well-being from accumulation of multiple roles [88-90]. In relation to physical health, support has, for example, been found in relation to general physical health [91], and obesity [92]. In relation to sickness absence, Mastekaasa (2000) found very little support in a Norwegian study for either role strain or role enhancement with regard to having children [79].

No support for either role strain or role enhancement hypothesis was found in relation to myocardial infarction in women [91] or overall mortality [93-95].

The associations between multiple roles and health are however complex. Waldron and colleagues hypothesised that health outcomes in relation to specific social roles may vary depending on the other roles held by women [96], and earlier studies have found that social roles could provide both stress and satisfaction depending on certain characteristics of profession, workplace, partner relationship, parental situation and life-stage [17, 97-102], in that the perceived quality of the roles is important. An interrelationship between multiple roles and health has been found to vary with socio-economic position [103]. Findings on multiple roles and health have also been discussed in terms of selection bias. In addition to the 'healthy worker' effect (i.e. healthier persons are more likely to be employed than less healthy persons), a 'healthy married' and 'healthy mother' effect have also been discussed, pointing to the possibility that health determines the social roles a person occupies. Khlat (2000) found support for such 'healthy married' and 'healthy mother' effect in a French national survey from the early nineties [81], while McMunn and colleagues did not find that the relation between multiple social roles and self-reported health could be explained by health selection in employment and parenthood [92].

A majority of the studies on multiple roles and health have been cross-sectional and fewer longitudinal studies have been conducted. In a longitudinal study on young American women, involvement in multiple roles contributed to better health owing to the beneficial effects of labour force participation and marriage [96]. Women occupying multiple roles over a long period in life reported good self-rated health at age 54 in a British study [92], while little support was found for the role strain or role enhancement hypotheses regarding mortality among British women with paid

work and young children [94]. In a study from The Netherlands on the number and combinations of social roles (worker, partner, parent), no significant effect on the risk of developing depressive or anxiety disorders (DSM-III criteria [104]) over a follow-up of three years was found [105].

Very few studies have been conducted in the Swedish context. In a longitudinal study on the importance of changes in numbers of social roles, Nordenmark (2004) found that an increasing number of social roles were associated with higher probability of well-being [106]. Even if multiple roles have often been found to be protective of women's health, role strain has been discussed as a possible explanation for women's sickness absence in the last decade in Sweden [7, 22].

With high female labour force participation [28], fairly high birth rate compared with other European countries [107] and universal social security systems for parents and families [108], a rare presence of domestic services and men's increase in domestic work participation (even if Swedish men internationally participate to a high degree) not growing fast [33, 109]. Thus, it is of interest to study multiple roles in a Swedish context.

Furthermore, women in Sweden have high sickness absence rates compared with most European countries [23]. To be sick-listed has been described as part of the sick role, and the sick role is also therefore a social role with certain demands and expectations that need to be fulfilled [110], such as demands of attending for health care on a regular basis and taking part in treatment and rehabilitation suggested by professionals. It is therefore possible that being sick-listed per se increases the strain on an individual in an already vulnerable life situation.

2.6 Experience of sickness absence

Women have higher sickness absence than men [23, 24]. For example the incidence of sickness absence with psychiatric diagnosis is higher in women than in men, and a study of Norwegian data found the highest incidence for women aged 35 to 40 years [26]. The average sickness absence, expressed as percentage of the workforce in Sweden, was in 1990 was 5.5% of the labour force, 2.5% in 1996 and 4.5% in 2001. Sickness absence is not evenly distributed in the Swedish population between gender, socio-economic positions, workplaces or regions [7], and the increase seen in the late nineties was more profound for women and employees in the public sector [22, 27]. In the year 2000 about 136 000 women in Sweden were long-term sick-listed (> 30 days), in comparison with 90 000 in 1991[7]. In an European perspective, Sweden, together with Norway and the Netherlands, had an more steeper increase in sickness absence rate during the nineties than other European countries [111]. The last few years, the sickness absence rate have decreased but with still a high rate of women on long-term sick-leave [112].

The research on ascendants for sickness absence has been considerably more developed [24], than that on the consequences of sickness absence, where only a few studies have been conducted [113]. The problem in differencing between health outcomes derived from sickness absence per se or from the illness/disease or injury causes sickness absence constitutes a main method problem in this research. A need for more research on the consequences of sickness absence has been stressed [114, 115], and recommendation of best sick-listing practice have been asked for [7].

According to earlier studies, negative consequences of sickness absence seem to be more common than positive consequences [113]. Since women being more sickness absent than men possible negative and positive consequences of sickness

absence are of profound interest to an understanding of women's health and ill-health. The sick-leave period itself can also be regarded as a specific exposure in women's lives, and a hypothesis might be that the effect of the sick-leave period itself can be a contributory factor to other risk factors for women's sickness absence.

In a Swedish qualitative study, of women between 30 and 49 years of age, participants (sick listed ≥60 days) reported that they had experienced an initial remedial period at the beginning of their sick-leave, but this relief was followed by a more destructive period with inactivity and isolation [116].

In a Swedish cross-sectional study participants reported negative effects of sickness absence, on leisure activities, sleep and psychological well-being, lifestyle habits and self-image as well as decreased desire for social and family activities. Small differences were found between negative and positive effects of sick-leave on relationships with partners and with other family members [115].

In studies from the US and Sweden, reduced-income trends for women and fewer promotions have been associated with previous periods of sick-leave [117-119], and a Finnish study found increased risk of job termination and unemployment in women with temporary jobs in the public sector after high rates of sickness absence [120]. Finally, a Danish study found sickness absence not to be a significant risk factor for suicide in women but only for men [121].

Those negative consequences found in earlier studies have also been shown to be associated with ill-health in other studies [122-125]. Thus, it might be that women enter a vicious circle of negative effects associated with sickness absence, and that these negative effects might lead to new health problems and/or to an exacerbation

of symptoms. It might be that such processes influence women with different health problems in different ways. For example, Floderus and colleagues found that effects were more polarised (i.e. the prevalence of both negative and positive consequences) in women with psychiatric diagnoses compared with those with musculoskeletal problems [115].

3. AIMS OF THE THESIS

3.1 General aim

The general objectives of this thesis was to analyse the importance of specific exposures in women's lives to health and sickness absence; more precisely to study the association between domestic work, multiple roles and the experience of being sick-listed, and self-rated health, psychiatric disorders and sickness absence.

3.2 Specific aims

Specific aims were

To study associations between domestic strain measured as domestic job strain, domestic work equity and marital satisfaction and self-rated health (Paper I)

To study associations between different aspects of domestic work and sickness absence (Paper II)

To study associations between single and multiple roles and health and sickness absence (Paper III)

To explore consequences of sickness absence by analysing changes in self-rated physical health (Paper IV)

4. MATERIAL AND METHODS

4.1 Overview of papers included in the thesis

In Table 1, an overview including aim, design, study population, sample-size, follow-up period and independent and dependent variables in the papers included in this thesis, is presented.

Table 1. Overview of the papers included in the thesis

	Paper			
	I	II	III	IV
Aim	To analyse the association between strain in domestic work and self-rated health	To analyse the associations between different aspects of domestic work and sickness absence	To assess cross-sectional and longitudinal associations between the occupational, partner and parent roles and combinations of these roles in relation to self-rated physical health, psychiatric disorders and self-rated sickness absence	To explore the association between experiences of sickness absence and self-rated physical health
Design	Cross-sectional	Cross-sectional	Cross-sectional and longitudinal	Longitudinal
Study population	Women aged 17 – 64 years and employed in Östergötland	Women aged 17 – 64 years and employed in Östergötland	Women in six birth cohorts (1935, - 45, -55, -65, -70, -75), and registered in Districts West and Central in Göteborg	Women in four birth cohorts (1935, - 45, -55, -65), and registered in District West in Göteborg
Sample size	1069	1059	600	231
Follow up	-	-	5 years	5 years
Independent variables	- Domestic job strain - Domestic work equity and marital satisfaction	- Domestic job strain - Domestic work equity and marital satisfaction - Parental responsibility - Caring activities related to children - Caring activities related to adults - Domestic life events or difficulties	- Single roles (Occupation, partner, parent) - Multiple roles (combinations of single roles)	- Sickness absence
Dependent variables	Self-rated health (SF-36)	Sickness absence	- Self-rated general physical health - Psychiatric disorders - Self-rated sickness absence	- Self-rated general physical health

4.2 Design and description of data

The empirical research of the present thesis was based on two population-based epidemiological databases of women. The projects were, ‘Women’s health and living conditions’ (WHL), a cross-sectional study from the county of Östergötland in the south east of Sweden, and ‘Women and alcohol in Göteborg’ (WAG), a longitudinal prospective cohort study on women living in Gothenburg, the second largest city of Sweden.

4.2.1 ‘Women’s health and living conditions’ (WHL)

Two papers in this thesis (I and II) were based on the project ‘Women’s health and living conditions’ (WHL). WHL is a multipurpose study of employed women 17 to 64 years old. The project was initiated in 1995 and the overall objective was to gain increased knowledge about women’s health, paid and unpaid work, living conditions and sickness absence in relation to working in male- and female-dominated occupations and workplaces [126]. Four occupational groups were chosen: metal workers, assistant nurses, nurses and medical secretaries.

A random selection was made of nurses and assistant nurses employed in geriatric hospital wards of general hospitals and of medical secretaries employed in general hospitals. The selection of metal workers was performed in two steps. Initially a list of all metal industries with female metal workers in the county of Östergötland was requested from the Swedish national trade union for metal workers. Second, all industries were contacted in the same order that they appear on the list with consideration of geographical spread. All female metal workers in 47 companies in different branches in the county of Östergötland were included in the project. The included companies employed between one and 244 women.

A questionnaire comprising 218 questions on women’s health and living conditions in paid and unpaid work was developed for the project. The questionnaire was

mailed to the women's home addresses. Two reminders were sent out, and those who failed to respond after the reminders were contacted for a telephone interview. Those who could not be reached by telephone were sent a third reminder letter. Women who were not fluent in Swedish were offered an interpreter. The questionnaire comprised detailed questions on issues related to women's domestic work and family relations. In the questionnaire, it was clearly stated that domestic work should be taken to include not only work tasks such as washing dishes, cooking, shopping, planning, cleaning, and so forth, but also caring for and looking after children and old or sick relatives or friends. All data were collected after informed consent had been obtained.

Sickness absence data were obtained from company registers for the first fourteen days of each sick-leave spell and from the local social insurance offices for sick-leave in excess of fourteen days regarding the number and duration of all sick-leave spells in 1995. Only data on sick-leave were included in the project. All women, both those who had answered the questionnaire and those who did not, were asked for permission to collect sickness absence data. In Table 2, study population, participation rate and sickness absence data are presented.

Table 2. Study population and sickness absence data in 'Women's health and living conditions' (WHL), Sweden, 1995

	Study population N (%)	Participated n (%)	Declined participation n (%)	Collection of sickness absence data n (%)	Declined collection of sickness absence data n (%)
Age group					
17-34	402 (100)	303 (75)	99 (25)	391 (97.9)	11 (2.1)
35-44	409 (100)	300 (73)	109 (27)	401 (98.1)	8 (1.9)
45-54	425 (100)	339 (80)	86 (20)	415 (97.7)	10 (2.3)
55-64	181 (100)	133 (74)	48 (27)	173 (95.6)	8 (4.4)
Occupation					
Medical secretary	203 (100)	162 (80)	41 (20)	195 (96.0)	8 (4.0)
Assistant nurse	204 (100)	154 (75)	50 (25)	199 (97.5)	5 (2.5)
Nurse	203 (100)	176 (87)	27 (13)	200 (98.5)	3 (1.5)
Metalworker	807 (100)	583 (72)	224 (28)	786 (97.4)	21 (2.6)
Total	*1417 (100)*	*1075 (76)*	*342 (24)*	*1380 (97.4)*	*37 (2.6)*

4.2.2 'Women and alcohol in Göteborg' (WAG)

In papers III and IV information from a population-based longitudinal cohort study, 'Women and Alcohol in Göteborg' (WAG) was used. WAG includes a screening questionnaire, a baseline interview and a follow-up every fifth year. The project also includes information on clinical psychiatric disorders, medical records and register-based sickness absence.

All women (n 3130) born in 1925, -35, -45, -55 and -65 and registered on 31 December 1985 in a suburban district of Göteborg (N=99328 inhabitants; Dec. 1995) were included in WAG and received a postal questionnaire called 'Screening Women and Alcohol in Göteborg' (SWAG, thirteen items)[127]. SWAG is a questionnaire aiming to identify alcohol-related problems. According to SWAG

responses, women were divided into three groups, no points, one to three points and ≥ 4 points depending on the severity of their alcohol-related problems. Those women with ≥ 4 points were considered to have the highest risk of alcohol dependence or abuse.

In the first study phase in 1990, a stratified sample (n 479), based on the SWAG scores including all women who scored ≥4 points, one of four of those who scored one to three points and one of fifteen of those who had no points were included, was selected for face-to-face interview.

In the second study phase in 1995, women from the first phase were re-interviewed. In this study phase, new cohorts of women born in 1970 and 1975 (n 2910) were included in the study. A stratified sample (n 829) based on SWAG scores was selected for face-to-face interview. In these younger cohorts women from a central district of Gothenburg were also included, and the stratification process was changed since the proportion of younger women was higher and they had higher alcohol consumption than the older birth cohorts. To avoid an over-inclusion of young women with high alcohol consumption but with small risk of alcohol problems, the cut-off level was increased to ≥5 points. Further detailed information on stratification process has already been published [128]. In the third study phase in 2000, women from study phases 1 and 2 were re-interviewed (Table 3).

Semi-structured interviews, face-to-face or postal, (referred to as full interviews) were conducted in all three study phases. This full interview comprised questions about health and living conditions from childhood up to the date of the interview and covered fields focusing on health, living conditions and lifestyle including a comprehensive section on alcohol-related questions. In the second and third study phases, a short interview (postal or by telephone) was also offered to women not

willing to give a full interview (owing to lack of time or other reasons). Apart from demographic questions, this short interview comprised only alcohol-related questions. Interviews in all three study phases were conducted by professionals in health and social care.

In WAG, psychiatric diagnoses (lifetime and last year) were generated on the basis of structured diagnostic questions at the interview occasions, in accordance with the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R (Study phases 1, 2) [129] and DSM-IV (Study phase 3) [130]).

After informed consent had been granted, information on register-based sickness absence was obtained from local insurance offices for the years 1991 to 2000. Information on number of sick-leave days, sick-leave spells and diagnoses was also collected from local social insurance offices.

Study design, data collection and participation rate in WAG is presented in Table 3.

Table3. Study design, data collection and participation in ‘Women and Alcohol in Göteborg’ (WAG), Sweden, 1986-2000

Study phase	Data collection Year	Selected N	Participated %	(n)
Screening of all women born 1925, -35, -45, -55, -65	1986	3130	78	(2432)
Baseline 1 interview – stratified sample of women born 1925, -35, -45, -55, -65	1990	479	83	(399)
Follow-up of baseline 1	1995	399	78	(313)
Screening of all women born 1970, -75	1995	2910	77	(2247)
Baseline 2 interview – stratified sample of women born 1970, -75	1995	829	74	(615)
Follow-up of baseline 2	2000	615	72	(442)

4.3 MEASUREMENTS

4.3.1 Independent variables

Aspects of domestic work

In papers I, II and IV different aspects of domestic work were examined. An overview of the independent variables used and aspects addressed in the different papers is presented in Table 4.

The first six variables with included items were obtained through the WHL questionnaire and the seventh measure was obtained through the WAG questionnaire.

Table 4. Description of independent variables analysed as aspects of domestic work

Aspects of domestic work	Content	Paper
'Domestic job strain'	Demand and control in domestic work	I and II
'Domestic work equity and marital satisfaction'	Responsibility for and division of domestic work together with a satisfactory relationship with spouse/cohabiter	I and II
'Parental responsibility'	Having a child/children < 7 years of age Having only a child/children 8-18 years of age Having one child Having more than one child	II
'Caring activities related to children'	Temporarily-ill children (i.e. receiving temporary child care allowance) Taking care of someone else's children Children with special needs (physical or mental handicap, chronic disease, serious acute disease in 1995, allergy, personality or social problems) Children with disability or disease (i.e. receiving childcare allowance owing to children's disability or disease)	II
'Caring activities related to adults'	Caring for an elderly, handicapped or sick adult Providing regular visits to an adult because of old age, handicap or illness/disease Providing regular support to close persons, such as adult children, relatives or neighbours	II
'Domestic life events or difficulties'	Financial problems Divorce/separation Serious illness of a family member Exposure of a (one's) child to violence or sexual abuse Death of a close relative Death of a close friend.	II
'Domestic responsibility'	Level of responsibility for household work (cooking, laundering), childcare and planning family activities	IV

Domestic job strain

Domestic job strain is an adaptation of the demand-control instrument for paid work, developed by Karasek & Theorell [131]. Domestic job strain concerned the everyday domestic work and included the same questions on demand dimension (excessive work, conflicting demands, insufficient time for tasks, working hard and quickly) and control dimension (task control and skill use) as the traditional demand-control model. High and low categories of demand and control were formed with a cut-off point corresponding to the median for each of these two dimensions following previous studies [108] on the demand-control model in paid work. This procedure classifies women into four exposure groups: 1. women with low demands and high control in domestic work, 2. women with high demands and high control, 3. women with low demands and low control and 4. women with high demands and low control in domestic work. These four groups define a natural order according to the theoretical concept of the traditional demand-control model, so that group 1 was considered as a low-strained group and group 4 as a high-strained group. According to the traditional demand-control model, the greatest risk to physical and mental health from stress affects persons facing high psychological workload demands combined with low control or decision latitude in meeting those demands [131].

Domestic work equity and marital satisfaction

Domestic work equity and marital satisfaction was developed from a theoretical concept, based on a qualitative study of women and men who had experienced long-term sickness absence [77]. This concept highlighted the importance of the division of the domestic work between partners as well as the perceived quality of the relationship in women's rehabilitation process.

Four questions were used from the WHL questionnaire to measure domestic work equity and marital satisfaction: ‘To what extent does your spouse/cohabiter help in planning and performing domestic work?’, ‘Irrespective of whether you are single or cohabiting, do you like the way you are living?’, ‘In general, do you have a good relationship with your spouse/cohabiter?’ and ‘Do you sometimes feel lonely?’. Response alternatives to the first three of these were ‘not at all’, ‘not particularly’, ‘yes, to some extent’, and ‘very much so’; response alternatives to the fourth were ‘often’, ‘sometimes’, ‘seldom’ and ‘never’. Domestic work equity and marital satisfaction was assessed as an index.

Parental responsibility

Parental responsibility was measured through four separate questions on age and number of children: ‘Having a child/children < 7 years of age’, ‘Having a child/only children 7-18 years of age’, ‘Having only one child’, ‘Having more than one child’ , with response categories of ‘yes/no’.

Caring activities related to children

This aspect included four separate items related to child care. ‘Temporary ill children’, related to days when parents stayed at home from work to care for sick children and received temporary parental benefits. Dichotomised as ≤/> 5 days/year. ‘Take care of someone else’s children’ related to how many hours per week a participant had been engaged in such work. Dichotomised as ≤/> 3 hours/week. ‘Children with special needs ’(yes/no) looked at the experience of having a child/children with a physical or mental handicap, chronic disease, allergy, personality or social problems, or serious acute disease. ‘Children with disability or disease’ (yes/no) related to those women granted a special childcare allowance for parents with disabled children or children with a chronic disease requiring particular superintendence and/or surplus costs.

Caring activities related to adults

This aspect was measured through three separate items related to care for adults. 'Care for an adult' considered whole or partial responsibility for care of an adult in need of extra care owing to old age, illness/disease or handicap. 'Regular visits to an adult' considered regular visits to adults owing to age, illness/disease or handicap. 'Regular support of close persons' considered participants giving extra support to close persons (for example, grown-up children, relatives, friends or neighbours). All items were dichotomised into 'yes/no'.

Domestic life events or difficulties

Within the aspect domestic life events or difficulties items explored were: 'Financial problems', 'Divorce/separation', 'Serious illness/disease of a family member', 'Child exposed to abuse' (a child who had been the subject of violence or sexual abuse), 'Death of a close relative' or 'Death of a close friend'. All items were measured with single questions with responses 'yes/no', with a recall period of twelve months for all items except for bereavements where the recall period was 24 months.

Level of domestic responsibility

Level of domestic responsibility covered three areas: household work (cooking, laundry), care for children and planning of family activities. The response categories were levelled by the extent to which the participant was responsible for the specific area. The response categories used were: 'always', 'most often', 'approximately 50 %', 'seldom', or 'never'.

Level of responsibility was assessed as an index. Firstly responses were recoded and summed to give a 6-point scale, with higher responsibility giving higher points. In paper III, a three-tier scale on responsibility for domestic tasks, was made. The

index was defined by grouping 0-2 points=low responsibility, 3-4= medium and 5-6=high. In paper IV the scale was dichotomized (due to a smaller sample size), classifying 0-3 points as low level, and 5-6 points as high level of responsibility. Women with 4 points was included in the final high level group if the original responses at the child care area were 'always' or 'most often', and in the low level group if having other responses.

Psychiatric disorder

The information on psychiatric disorder was generated on the basis of structured diagnostic questions at the WAG interviews according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) (in 1990)[129] and DSM-IV (in 1995 and 2000) [130]. At the baseline interviews, information on lifetime and at last year was asked for. At the follow-up interviews (in 1995 or 2000), the same questions were used but the interviewees were asked to give information for the last five years only. Disorders included were affective disorders, anxiety disorders and depression of shorter/longer duration and minor/greater severity. In the analyses psychiatric disorders were dichotomised at the first interview as 'no disorder or at least one disorder during lifetime or last year' and, at the second interview as 'no disorder or at least one psychiatric disorder during the five-year follow-up period'.

Single and multiple roles

In paper III, single and multiple roles were examined in relation to different health outcomes.

A single role (occupational, partner or parent) or combinations of these roles (multiple roles) were measured. Information on the roles was obtained through the WAG questionnaire. The occupational role was operationalised through information on women's present occupation. Only women working full- or part-

time or studying were defined as having an occupation. The partner role was operationalised through information on marital status. Married women and those living in a cohabiting relationship for ≥ 3 months were considered as being/having a partner. The parental role was operationalised in two different ways: 'ever parent', defined as ever having had a parenting role to biological, step- or adopted children and, 'parent with child/children at home', defined as having a child/children < 14 years living at home.

Since women often combined several roles at the same time, different combinations of contemporaneous roles were measured in an attempt to describe women's daily life better. The following combinations were examined: 1.occupation, partner, parent, 2. occupation, not partner, parent 3. occupation, partner, not parent, 4. occupation, not partner, not parent and 5. no occupation and different combination of the roles of being/having a partner or being a parent. Owing to the small number in each specific combination, the fifth category was a mixed category with several combinations of the analysed roles.

Sickness absence

In paper IV sickness absence was used as an independent variable. The purpose of sickness insurance benefits is to guarantee economic support to people whose capacity to work is reduced owing to illness, disease or injury, and is based on two requirements: first own illness/disease or injury and, second, work ability/capacity has to be reduced by at least one quarter because of this illness/disease or injury. During the time covered by this thesis, all Swedish residents aged sixteen to 64 years with an annual income of at least EUR 600 (SEK 6000 in 1991 to 1995) were covered by a national sickness insurance amounting to 80% of their income. There was no maximum number of days for which sickness insurance benefit could be

paid. A physician's certificate was compulsory from the eighth day and the first day in each sick-leave spell was a qualifying day for which no benefit was paid [1].

In paper IV, registered data on sickness absence, collected from local insurance offices, were used. Data were collected after informed consent, and information for the years 1991 to 1995 was obtained. Information on all sick-leave days including the beginning and end of all sick-leave spells and the diagnoses for these spells was obtained. Each day of sick-leave was counted as one, regardless of whether the woman was on full- or part-time absence. Two different measures of sickness absence were used. Any sick-leave, defined as sickness absence >14 days, adding all sick-leave days from 1991 to 1995 in spells > 14 days, and long sick-leave, defined as sick-listed in at least one continuous spell of sick-leave > 30 days during 1991 to 1995.

4.3.2 Dependent variables

Self-rated health

In papers I, III and IV self-rated health was used as the dependent variable of interest. Two different measurements of self-rated health were used, the short-form 36 (SF-36) [132] and from this a general measure of self-rated physical health.

SF-36 includes thirty-six items on how a person perceives their health and their ability to perform different daily activities and the barriers to performing these activities owing to ill-health. Eight dimensions of self-rated health are covered in SF-36: physical functioning, physical role, bodily pain, general health, vitality, social functioning, emotional role and mental health, and the instrument has shown high reliability and good content validity [133]. The SF-36 scores range from zero to 100, where a score of 100 implies an absence of impairment.

In paper I, seven of the eight dimensions of SF-36, with a recall period of four weeks, were examined. The dimension of physical functioning was excluded from the analyses owing to nonlinearity.

In papers III and IV, general self-rated physical health was examined. General self-rated physical health was measured by these questions in interviews in 1990 and 1995: 'In general, how would you say that your physical health has been the last year?' with response categories 'excellent', 'good', 'reasonable' and 'bad', and in 2000: 'In general, how would you rate your health? with response categories 'excellent', 'very good', 'good', 'reasonable', 'bad'. In the analyses, self-rated physical health was dichotomised to classify the response categories 'excellent', 'very good' and 'good' as having good health, and the response categories 'reasonable' and 'bad' as having poor self-rated physical health.

In paper IV, the interest was in changes in general self-rated physical health between two interview phases. The outcomes were divided into four possible outcomes: 1.Positive stable, (women who assessed their self-rated physical health as good in 1990 and good in 1995), 2. Negative stable (poor in 1990 and poor in 1995), 3. Positive change (poor in 1990 and good in 1995) and 4. Negative change (good in 1990 and poor in 1995).

Psychiatric disorder

The assessment of psychiatric disorder was described under section 4.3.1 Independent variables

Sickness- absence

Sickness absence was used as the dependent variable in papers II and III. Register-based sickness absence (> 14 days) from the local insurance offices, and sickness absence information (≤ 14 days) from the employers, as well as self-rated sickness absence (> 3 months) has been analysed.

Sickness absence has in earlier studies been found to be a good measure of health [134, 135] and self-reported sickness absence has in recent studies been found to have good agreement with register-based data [136, 137].

Sickness absence data were obtained from local insurance offices for the number and duration of all sick-leave spells exceeding fourteen days in 1995. The first fourteen days of each sick-leave spell were confirmed by the included companies. Information on sick-leave spells that had not ended by 31 December 1995 was followed up for at least 30 days. The sick-leave data were then stratified into different durations of sick-leave in line with earlier recommendations [138].

In paper III, information on self-reported sickness absence was obtained from the interviews in WAG. Self-reported continuous sick-leave > 3 months was measured with the single question: 'Have you ever been sick-listed for more than three months running?'. At follow-ups, continuous sick-leave > 3 months during the last five years was measured.

Information about the Swedish sickness absence regulation scheme was described under section 4.3.1 Independent variables.

4.4 Statistical analyses

Overall parametric methods were used in this study. Associations between independent and dependent variables were analysed with bivariate and multivariate regressions adjusted for potential confounders. Further detailed stratified analyses aiming to detect effect modifications were conducted.

In paper I, domestic job strain was analysed as a four-level ordinal scale and a trend analysis was done to ensure the natural order in this concept. In paper II, domestic job strain was dichotomised, with low demands and high control and high demands and high control were defined as low strain, while low demands and low control and high demands and low control were defined as high strain.

The internal consistency reliability in the measure called 'Domestic work equity and marital satisfaction' was estimated by use of Cronbach´s alpha. The internal reliability in this measure was 0.61. In paper I, domestic work equity and marital satisfaction were analysed as quartiles and in paper II this measurement was dichotomised as low/high level according to the mean.

Pearson's chi-square test was used in papers I and IV and some of the results in paper IV were presented as a Pearson's chi-square distribution.

Linear regression analysis in three models, yielding standardised regression beta coefficients, with 95, % confidence intervals (CI) were used for associations between domestic job strain and domestic work equity and marital satisfaction and scales in SF-36 in paper I. As the variance differs between the seven scales included in SF-36 scales, the scales were transformed to z-scores (mean=0, sd=1) in the linear regression models.

In papers II, III and IV, logistic regression analyses with bivariate and multivariate models were used, yielding odds ratios (OR) with 95 % confidence intervals. In the papers, logistic regressions were also used for analyses of stratified subsamples.

The SPSS package for Windows (SPSS Inc. 13.0-15.0) [139] was used in papers I and II and the Statistical Analysis System (SAS) 8.2 [140] was used in papers III and IV. In addition, to handle the weighted data in the WAG project correctly, the Software for the Statistical Analysis of Correlated Data 9.0 (SUDAAN)[141] was applied.

5. ETHICAL CONSIDERATIONS

This thesis was written in accordance with the World Medical Association Declaration of Helsinki – Ethical Principles for Medical Research Involving Human Subjects [142]. Studies I and II were approved by the Regional Ethics Committee for Human Research at the Faculty of Health Sciences of Linköping University, Linköping, Sweden (Dnr 94148) and studies III and IV by the Research Ethics Committee of the Medical Faculty at Gothenburg University, Gothenburg, Sweden (Dnr: 320-85, 158-94).

All participants were informed about the aims of the projects. For WHL this information was sent out together with the postal questionnaire, in WAG both by letter sent to the selected participants and oral information at the time of the interviews. The participants were told that all participation was voluntary and they could withdraw at any time. In both projects, subjects that could be perceived as personal, such as certain health questions, questions about alcohol and drugs, intimate partner violence and physical or sexual abuse, were included. The participants in both projects were told that they could omit responses to specific questions without giving any reason for this. If certain subjects in the WHL and WAG interviews identified any need for further health counselling, the interviewers could also direct the participants to further health services.

Even though some of the areas covered in the questionnaire and interviews could be considered as personal, these aspects should be viewed in the light of the need for a deeper knowledge on women's health and the importance of domestic work and multiple roles. Hopefully this knowledge can be of benefit for women by

increased knowledge on the importance of this work and multiple roles for women's health.

Information on addresses to the participants in the WHL was received from the employers. This was the only way to get information on employees in the four specific occupations addressed in that study. Information regarding the procedure was given to all unions involved, and no questions were raised. The employers were not involved in any other part of the distribution of questionnaires or contacts with the participants. It was clearly stated in the information letter that any information about participation in the study or information related to specific participants would not be given to the employers.

Informed consent was obtained for all studies in this thesis. All questionnaires (WHL) or written material on the semi-structured interviews (WAG) were anonymous to safeguard personal identity. All material was kept in locked archives at the Department of Health Sciences, Linköping University (Studies I-II), and at the Department of Social Medicine at the Sahlgrenska Academy, Gothenburg University (Studies III-IV).

6. RESULTS

Results from the four papers in this thesis will be presented below starting with an overview, including focus and the main findings in the papers. Results will then be presented separate for each paper in the following text.

6.1 Overview of focus and main findings in paper I-IV

In Table 5, focus in the papers and the main findings will be presented

Table 5. Overview of the focus and main findings in paper I-IV

Paper	Focus	Main findings
I	Strain in domestic work operationalised as 'Domestic job strain' and 'Domestic work equity and marital satisfaction' and their cross-sectional associations with seven dimensions of self-rated health (SF-36) in employed women	Higher 'domestic job strain' and a lack of 'domestic work equity and marital satisfaction' were associated with lower self-rated health. The strongest associations between 'domestic job strain' and a lack of 'domestic work equity and marital satisfaction' and SF-36 were found for vitality and mental health.
II	Domestic work operationalised as six aspects * 1. 'Domestic job strain' 2. 'Domestic work equity and marital satisfaction' 3. 'Parental responsibility' 4. 'Caring activities related to children' 5. 'Caring activities related to adults' 6. 'Domestic life events or difficulties' and their cross-sectional associations with duration of sick-leave spell in employed women.	- No associations were found between 'domestic job strain' and duration of sick-leave spell - Higher OR for *any sick-leave spell* was found for a lack of 'domestic work equity and marital satisfaction' - Lower OR for *any sick-leave spell* was found for 'parental responsibility' i.e. having children < 7 years of age, or having more than one child. Higher ORs for *medium-long sick-leave spells* were found for: -'caring activities related to adults': for the items 'caring for an adult' and for 'providing regular support to others' Higher ORs for *long sick-leave spells* were found for: -'caring activities related to children': for 'having children with special needs', and for 'taking care of someone else's children' Higher ORs for *medium-long sick-leave spells* were found for: -'Domestic life events or difficulties': for 'having a child exposed to abuse'
III	Single roles (occupation, partner and parent) and combinations of these roles and their cross-sectional and longitudinal associations with self-rated physical health, psychiatric disorders and self-rated sickness absence.	Occupation was related to lower OR for poor self-rated physical health and sickness absence, while the parental roles was associated with higher odds for sickness absence. A combination of occupation and partner role was associated to lower ORs for all health outcomes in comparison with women occupying all three roles. Support was found for the role strain hypothesis in the cross-sectional analysis of multiple roles, while neither role strain or role enhancement was supported the five year follow up.
IV	Changes in self-rated physical health in relation to experience of sickness absence over five year follow up.	A lower proportion of women reporting good health at both baseline and follow up were among those who experienced sickness absence. Women with psychiatric disorders at baseline had higher odds for a change from poor to good health over the follow up if sick-listed. Women with high level of domestic responsibility and sick-listed had increased ORs for both a positive and a negative change in self-rated physical health.

* Aspect 1 and 2 were analysed as indices. Within aspect 4 to 6 single items were analysed.

6.2 Paper I

Domestic job strain' and 'Domestic work equity and marital satisfaction' were analysed in relation to seven dimensions of SF-36 in this study.

Women with children, irrespective of cohabiting status, reported high domestic job strain (27.4% of single women, 33.0% of cohabiting women) to a significantly greater extent than women without children (9.7% of single women, 17.4% of cohabiting women), as did a significantly higher proportion of the cohabiting women without children (17.4%) compared with single women without children (9.7%). These stratification groups did not, however, differ significantly in self-rated health (SF-36).

In the bivariate analyses of domestic job strain and SF-36, significant negative associations were found in relation to the following SF-36 dimensions: general health, vitality, social function, emotional role and mental health. In the multivariate analysis where demographic factors, domestic harassment, paid work related factors and work-family conflict were adjusted, negative associations were still found in relation to mental health β -.123 ($p < 0.001$), vitality β -.156 ($p < 0.001$), general health β -.083 ($p < 0.05$) and social functioning β -.072 ($p < 0.05$).

In relation to domestic work equity and marital satisfaction, the women in the study reported low strain and no differences were found between women with different marital or family status. No differences according to stratification groups were found in relation to SF-36.

Domestic work equity and marital satisfaction were associated with all seven included health dimensions of SF-36 in the bivariate analysis. In the fully-adjusted model, higher levels of strain were associated with lower scores in SF-36 for

mental health with β -.211 ($p < 0.001$), vitality β -.195 ($p < 0.001$), general health β -.101 ($p < 0.01$), social function -.132 ($p < 0.01$), physical role β -.115 ($p < 0.01$), emotional role β -.079 ($p < 0.05$).

6.3 Paper II

In this paper, six different aspects of domestic work were analysed in relation to duration of sick-leave spells. Additionally within some of the aspects, different items were analysed.

In order to be more sensitive to different pattern of sickness absence, sick-leave spells were stratified into four duration categories: Any sick–leave spell (defined as at least one new sick-leave spell during the year, short sick-leave spell (defined as at least one new sick-leave spell of 1-7 days during the year), medium-long sick-leave spell (defined as at least one new sick-leave spell of 8-30 days during the year), and long sick-leave spell (defined as at least one new sick-leave spell of >30 days during the year).

An overview of the results in the study is presented in Table 6. Only aspects and items significantly associated to any of the sick-leave duration stratifications are presented in the table.

The aspect of domestic job strain was not associated with sickness absence irrespective of duration of sick-leave spell, and neither did the following items included in the aspects of caring activities related to adults and domestic life events or difficulties: regular visits to an adult, divorce/separation, serious illness of a family member, death of a close relative, and death of a close friend. None of the

six aspects or items was associated with short spells of sick-leave (one to seven days).

Possible effect modifications between domestic job strain, domestic work equity and marital satisfaction and having at least one new sick-leave spell during the year were analysed for women with different civil status or different numbers or ages of children, but no such modifications were found.

Aspects or items that reached significance in relation to any of the stratifications of sick-leave spells in the bivariate analysis were further analysed adjusting for potential confounders.

In table 6 results from significant multivariate associations between aspects of domestic work and sick-leave spells, stratified by different duration are presented.

Table 6. Significant multivariate associations between aspects of domestic work and sick-leave spells, stratified by different duration, presented as Odds Ratios (OR) with their 95% Confidence intervals

Aspect of domestic work	Any sick-leave spell OR (CI 95%)[1]	Medium-long Sick-leave spell OR (CI 95%)[1]	Long Sick-leave spell OR (CI 95%)[1]
Domestic work equity and marital satisfaction	1.42 (1.04-1.95)	NS	NS
Parental responsibility			
- Child/children < 7 years of age	0.88 (0.83-0.94)	NS	NS
- > one child	0.94 (0.90-0.98)	NS	0.88 (0.81-0.95)
Caring activities related to children			
- Temporarily ill child/children > 5 days/year	2.27 (1.28-4.04)	2.13 (1.09-4.20)	NS
- Caring for someone else's children > 3 hours/week	NS	NS	2.73 (1.30-5.74)
- Children with special needs	NS	2.10 (1.05-4.19)[2]	NS
- Child with disability or disease	NS	NS	5.25 (1.08-25.66)[2]
Caring activities related to adults			
- Caring for an adult	NS	2.26 (1.23-4.18)	NS
- Providing regular support to others	NS	1.64 (1.02-2.63)	NS
Domestic life events or difficulties			
- Financial problems	NS	1.60 (1.03-2.47)	NS
- Child exposed to abuse	NS	5.84 (1.14-29.92)	NS

[1] Adjusted for age, job strain in paid work, conflicts between work and family and general self-rated health. [2] Significant after adjustments for age, job strain in paid work and conflicts between work and family but not significant in the fully-adjusted model.
The reference for domestic work equity and marital satisfaction was equity/satisfaction (as opposed to inequity/lack of satisfaction), the reference for temporarily-ill children was ≤ 5 days/year, the reference for taking care of someone else's children was ≤ 3 hours/week and the reference for all other explanatory variables was non-exposure.

6.4 Paper III

This study focused on the associations between social roles (i.e. occupation, partner and parent) and health and sickness absence. Single roles as well as combinations of these roles were analysed in relation to self-rated physical health, psychiatric disorder and self-rated sickness absence (continuing > 3 months). Both cross-sectional (for first and second interview) and longitudinal analyses were made.

At the first interview: partner was significantly associated with psychiatric disorder with an OR of 0.58 (0.35-0.98). At the second interview: occupation was significantly associated with both self-rated physical health, OR 0.28 (0.10-0.82), and sickness absence, OR 0.25 (0.10-0.86). For the parental roles (both 'parent ever' and 'parent with child/children at home'), significant associations were found in relation to sickness absence OR 5.16 (2.04-13.04) and 4.17 (1.86-9.38) respectively at the first interview. After adjustment for level of domestic responsibility and children with special needs the associations between parental roles and sickness absence were still significant with an OR of 3.0 (1.01-8.86) and OR 2.8 (1.10-6.95).

Cross-sectional analyses of different combinations of the three single roles, occupation, partner and parent were also performed for both first and second interviews. In the analyses the combination of having an occupational role, a partner role and parental role (children < 14 years living at home) was the reference group An overview of the results is presented in Table 7. Only significant associations between any of the role combinations and dependent variables analysed are presented in the table.

Table 7. Cross-sectional significant multivariate associations of different role combinations in relation to dependent variables at first and second interviews, presented as Odds Ratios (OR) with their 95% Confidence intervals (CI)

	Poor self-rated physical health OR (CI 95%)[1]	At least one psychiatric disorder OR (CI 95%)[1]	Have taken Sickness absence > 3 months OR (CI 95%)[1]
Occupation – partner - parent	1.0	1.0	1.0
Occupation - partner	0.47 (0.23-0.97) (Second interview)	0.62 (0.39-0.99) (First interview)	0.27 (0.10-0.77) (First interview) 0.28 (0.11-0.72) (Second interview)
Occupation		0.65 (0.44-0.95) (Second interview)	0.25 (0.10-0.65) (First interview)
No occupation – different occupation[2]	2.08 (1.16-3.76) (Second interview)		3.33 (1.25-8.87) (Second interview)

[1] Adjusted for age, alcohol dependence and abuse and socio-economic position.
[2] This group differed regarding reasons for being occupied in paid work or studies such as being on disability pension, homemaker or unemployed not in search of work, and had small numbers in different role combinations.

No significant associations were found for having an occupation, no partner and a parental role (i.e. single mother) and dependent variables, either at first or at second interview.

In the longitudinal analysis, association between role combinations at first interview and dependent variables five years later at the second interview was analysed. When adjusting for age, alcohol dependence and alcohol abuse, socio-economic position and health (dependent variable) at the first interview, no significant associations were found between any of the role combinations and poor self-rated physical health, psychiatric disorder or sickness absence five years later.

6.5 Paper IV

In this study sickness absence was used as an independent variable and associations to changes in self-rated physical health during a follow up period of five years were assessed. Four possible categories of changes in self-rated physical health were identified and analysed and separate analyses were made in relation to psychiatric disorders and different levels of domestic responsibility.

Most women maintained stable good self-rated physical health between baseline and follow-up, irrespective of experienced sickness absence (any sick-leave or long sick-leave) or otherwise. A significantly smaller proportion, however, 25% of those who had any sick-leave between 1991 and 1995, reported their physical health as positively stable compared with 75% of those who had not been sick-listed. The corresponding figure for those with long sick-leave was 14% compared with 86%. No significant differences between exposed and unexposed women for the outcomes negative stable, negative change and positive change in self-rated physical health were found.

After adjustments for age, women experienced long sick-leave had 5.5 times higher Odds Ratio (OR) (95% CI 1.5 – 21.1) of belonging to the negative stable category, compared with belonging to the positive stable category. When prior sick-leave during the period 1986 to 1990 was also taken into account, the OR was 4.1 (1.1-15.4). A significant association between experienced long sick-leave and being in the negative change category was found with an OR of 4.9 (95%CI 1.1-22.6) in the age-adjusted model. The reverse result was found for women with a psychiatric disorder at baseline and experienced long sick-leave during follow-up, where OR for belonging to the positive change category was 9.9 (95% CI 1.7 – 58.5) in the fully-adjusted model.

For women who reported high levels of responsibility in domestic work at follow-up and experienced long sick-leave the ORs for belonging to the negative change category were 20.3 (3.0-139.7) in the fully-adjusted model, and the OR for belonging to the positive change category was 5.1 (1.2-22.2). No significant associations with self-rated physical health were found in relation to any sick-leave.

7. DISCUSSION

The general objectives of this thesis was to analyse the importance of specific exposures in women's lives to health and sickness absence; more precisely to study the association between domestic work, multiple roles and the experience of being sick-listed, and self-rated health, psychiatric disorders and sickness absence.

Specific exposures were in this thesis interpreted as situations or events that not exclusively are experienced by women but that more often are experienced by women and by a higher proportion of women than men. Women's sickness absence constitutes of two thirds of the sickness absence days. Women contribute to a higher degree in domestic work by more often working part-time and by spending more time on domestic work in comparison to men. There is also a distribution between men and women regarding what kind of domestic work that is performed or taken responsibility of. Multiple roles are held by both women and men, but the meaning of a certain role could differ according to earlier studies, and thus it is of interest to specifically focus on women's multiple roles as a source of health or illness. The departure of this thesis has been to explain and explore how such specific exposures contribute to women's lower self-rated health and higher sickness absence.

In this section, some of the findings from the performed studies in this thesis will be discussed and possible ways of operationalising domestic work and describing its content will be presented.

7.1 Every day domestic work – single-handed or together?

In this thesis higher domestic job strain and a lack of domestic work equity and marital satisfaction were associated with lower self-rated health (SF-36), also after extensive control for demographic and paid work factors including conflicts between work and family. Irrespective of measurement, the strongest negative associations were found in relation to vitality and mental health. This result was partly in line with findings from the Whitehall II study showing that women perceiving low control at home had higher odds of suffering from depression and anxiety than those with high control, after adjustment for demographic and paid work factors [75]. Earlier studies have also showed an association between factors related to the domestic work and women's psychological well-being [46, 84], which could provide an explanation for the present results. For co-habiting women perceiving a lack of domestic work equity and marital satisfaction, physical or mental health problems could contribute to a general strain in the relationship or, low socio-emotional support from a spouse/cohabiter and perceived inequity in the division of domestic work could also be involved in the development of physical and mental health problems. Some support for this has been found in earlier studies on psychological distress in that perceived inequity in the division of domestic work was a strong contributory factor in women's psychological distress [45, 46]. In a US study on dissatisfaction with social relationships and associated psychiatric disorders, not getting along with one's spouse was associated with more psychiatric disorders than dissatisfaction with other relationships [143]. However, due to the cross-sectional design, the directions of the associations found in this study cannot be disentangled. It is possible that low vitality and mental health problems have influenced the assessments of domestic job strain and domestic work equity and marital satisfaction.

Domestic job strain and sickness absence was not associated in paper II. An earlier study by Voss and colleagues (2004), found a somewhat reduced risk of sickness absence in women being responsible for the largest part of the everyday domestic work [43]. The societal support provided to working women with children in Sweden might be one reason for the lack of association between sickness absence and general domestic work. Contrary to Voss, however, (2004) no effect modification was found in the present study in women with children and high domestic job strain. Differences in measures of domestic work could explain the different results, where Voss assessed 'total' responsibility for the domestic work.

Conversely, the importance of perceived equity in domestic work and a satisfactory relationship with partner was also seen also in relation to sickness absence. Since no earlier study has combined an analysis of the division of domestic work and marital satisfaction, comparison with other studies is not possible, although the division of domestic work [46] as well as marital relational quality [98, 144] has been found to be important for women's health in different studies. Another possible interpretation of the results of the present study might be that sickness-absent women to a higher degree tend to take responsibility for domestic work (while already at home) and so might perceive a lack of domestic work equity to a greater extent.

7.2 To have children and to be a parent – inconsistent associations with health and sickness absence

The results on domestic work in relation to 'children' were inconsistent in papers I and II. Women (single or cohabiting) with children reported significant higher domestic job strain, but no lower self-reported health than women without children. For sickness absence, however, if the associations found in paper II were causal,

the presence of more and younger children could be interpreted as protective. It is thus important to remember that this study was conducted in a society with well developed day-care facilities, long full-time parental leave, and child care allowance for occasions when children are temporarily ill as well as the possibility of a working-day reduction for parents when children are younger [108].

Results from this thesis suggest, however, that if measurements of children are expanded, looking more closely into, for example, extended care for children (i.e. children with special needs or exposure of one's child to abuse) this could be of relevance in achieving more knowledge on the importance of children on health and sickness absence. The measure of children as an indicator of domestic work could therefore be questioned when used as the only measure of domestic work, since this measure is very imprecise. Not only the presence of children but also the content of care and the context in which it is performed are probably of relevance [20]. It is possible that the higher odds for sick leave (in medium and long spells) in women with extended caring activities was the result of an excessive, prolonged high amount of work and worry, and role strain theories [16] might provide an explanation for the findings. Caring activities could add increased demands to the general domestic work, owing to the increased number of necessary tasks in relation to an adult or child with disease or limited functional ability. There might be conflicting expectations between different types of work or feelings of anxiety or sadness related to having a relative with specific needs [145]. Earlier studies have shown that mothers of children with rare diseases reported high levels of physical and emotional strain [146] and caregivers of children with disabilities have described negative physical, emotional, and functional health consequences of long-term informal care giving [147]. An earlier study has also shown higher rates of psychological distress in mothers who experienced their child being exposed to sexual abuse, and also that such an experience could affect women's health later in

life [148]. Psychological distress could probably explain the higher sickness absence rate found for women with this experience.

Increased work demands might also influence the possibility of rest and recovery as well as the opportunity to participate in own treatment and rehabilitation, measures which might all contribute to an extended duration of sick leave. Difficulties for women on sick leave to focus on their own needs in the rehabilitation process because of domestic strain have been described by colleagues [77, 149] and the importance of social support from family and friends have been pointed out [150]. This is of course important, not least in attempts to shorten the duration of a sick-leave period.

About 85% of the Swedish women born in 1960 have given birth at the age of 41. Adding adoptive, step- and foster-children into the equation, the proportion of women being parents is even greater [151], meaning that a large number of women in Sweden have a parental role. The parental role could be seen as loaded with both health beneficial situations such as being needed, having a meaningful role to fulfil, close social network and strong emotions of love and an increased amount of work tasks, possible feelings of worry, increased opportunities for conflicts between the needs of children and other important roles to fulfil which might affect health negatively [20]. Children and the care for children will also be a main aspect for women to handle in the intersection between paid and domestic work.

In this thesis, women with children reported higher strain in their domestic work, but as mentioned earlier no associations with self-rated health were found. In relation to sickness absence, parental responsibility was found to be associated with a lower probability of sickness absence. Parental roles (ever parent and parent with children < 14 years of age at home) were, however, associated with a higher

probability of self-reported sickness absence of long duration, thus suggesting that the context in which care for children is performed is important.

Lack of time, deteriorating relationship between the parents [31] and parental economic stress [152] have been put forward as factors that could influence health in parents negatively. Moreover, unlike other social roles, such as occupation and partner, also containing positive and negative factors for health, the parental role is not ‘exchangeable’. Thus, the parental role is of interest from a health perspective for both women and men, not the least since there are a lot of social and cultural expectations of mothers and fathers. Parents in modern societies have to juggle a lot of work originating from the needs of the children but also from expectations about what makes a good parent.

A burdensome parental role could also be an indicator of unequally distributed domestic responsibilities [99]. In a society with strong gender equity context, the expectations of division of work tasks that are related to child care might even be higher than for other domestic work tasks.

The parental role can at certain times chafe against the occupational role, with potential conflicts and negative consequences for health [70]. In welfare societies with universal security systems for parents such problems are intended to be less prominent [153] but this might not be enough in a society like Sweden, where high demands at work combine with high expectations of performance in other life parts. Job strain in paid work have been found to be more prevalent in women than in men with women perceiving less control at work, and it has been discussed that work-family interface or parental status could be part of the explanation for this gender difference [154].

Since sickness absence was measured with a lifetime perspective, the results on parental roles and sickness absence might be reflecting other factors prior to role occupancy, such as pregnancy-related sickness absence, for which it was not possible to control.

7.3 Caring activities related to adults – a relevant aspect to recognize

For many women, domestic work involves caring for other adults owing to old age, handicap, or illness/disease, or providing support to grown-up children [155]. People providing informal care to adults have also been found to have higher rates of affective and anxiety disorders as well as a higher utilisation of mental health services [145]. It might be that this aspect of domestic work includes emotional as well as physical loading, both of which can affect women's health negatively. Both caring for an adult and providing regular support to others were associated with higher sickness absence. Only associations with a medium-long sick-leave spell were established. As for women with greater demands from caring activities for children, women shouldering demands from care of adults could also experience difficulties in focusing on their own rehabilitating process which might contribute to an extended duration of sick leave. The finding regarding care for adults might also be of greater significance in the future in the light of the postponement of family formation, which is seen especially in urban areas in Sweden [156]. In this situation, the period of intensive childcare will increasingly coincide with the care of older relatives, with the possible result of an increase in domestic work and health effects on women.

7.4 An occupational role and a partner role – associated with better health

In line with several earlier studies we found a positive association between the occupational role and health [36, 90, 95, 99]. Occupation per se are supposed to have a beneficial effect on health as this represent a primary source of benefits such as income, social relations or skill development [131]. Occupation may also be a buffer against demands experienced in other social roles, such as domestic workload in women with children. In a prospective study, the importance of women's paid work to women's mood compared with family situation was examined, suggesting a generational shift where the importance of paid work increased as an influential factor compared with family situation with regard to women's mood and to younger women [157]. This is interesting, since a large part of the study group examined in paper III were younger women who had grown in the Swedish cultural norm of gender equity and women's independence supported by occupation and related income opportunities. It is important to bear in mind, however, that the findings on occupational role were cross-sectional and therefore a healthy worker selection cannot be ruled out. Given the highly-paid labour force participation by Swedish women and that this finding was found in a general population study, it is likely that the healthy selection is less pronounced.

Earlier research have showed a positive association of partnership and partner role with women's mental health [98, 105, 158], and in this thesis a lower odds for a psychiatric disorder was found with regard to the partner role. The partner role is complex, implying both 'give' and 'take', and it is not possible to discover whether it is having or being a partner that is most important for health outcomes. It is likely, however, that a well-functioning partner role may be an important source of social network and social support, both of which have been shown as important for health in several earlier studies [159-162]. Owing to the cross-sectional design and the fact that psychiatric disorder at baseline was measured over the lifetime span,

the results might also be a reflection of earlier life experiences and not be an effect of the partner role per se.

7.5 Role strain or role enhancement – further elaboration is needed

To have a solely occupational role or to have a combination of occupation and partner roles was found to be associated with lower odds for a psychiatric disorder and sickness absence. The combination of occupation with a partner role was further associated to lower odds for poor self-rated physical health. The results were found with the combination of occupation, partner and parent as reference. Thus, this could indicate that the parental role might influence women's health negatively in the context of combining this role with other roles, which supports the role-strain hypothesis. This result was in line with a study from Iceland, a country with a similar context to Sweden as regards parental employment and a highly available public system for parents and families; that study showed that employed parents, parents aged 25 to 54 and parents with more than one child living at home were more exposed to strain associated with the parental role [163]. Earlier studies have also shown that difficulties in balancing work and family demands are detrimental to women's health [65, 164].

None of the role combinations, however, predicted health outcomes or sickness absence five years later when adjustments including initial health were made. This result was similar with results from The Netherlands where no associations were established between different combinations of worker, partner and parental roles or number of roles and incidence of depressive or anxiety disorders or poor mental health (SF-36) over a follow-up of three years [105]. Results from earlier longitudinal studies on multiple roles have foremost showed positive effect in

outcomes related to well-being [92, 96, 106], while in relation to more well-defined outcomes (mortality, psychiatric disorders) results have not been so clear [93, 105].

Inconsistencies in the findings point to a need to go beyond simplified expectations of either role strain or role enhancement and examine in more detail the contexts within which social roles or combinations of roles are enacted to get further knowledge about the complexity of multiple roles.

Although the exposure of multiple roles has not been a common focus in sickness absence research, women's juggling to make the jigsaw puzzle fit has often been publicly debated as part of the explanation of women's high sickness absence. As regards women's health, it is important to find out more about whether periods of sick-leave can only be considered as positive for women's subsequent health, or if the effects of taking sick-leave can be a contributory factor to other risk factors for women's sickness absence and their ability to hold simultaneous social roles.

7.6 Experience of sickness absence

The point of departure of the study on experiences of being sick-listed was an exploration of the hypothesis that women, being more often sick-listed, will also be more exposed to the pros and cons of being on sick-leave, which might influences subsequent health outcomes. Women who reported co-occurrence of high levels of domestic responsibility together with long sick-leave had significantly higher ORs for belonging to the negative change category. This could be seen as supportive for the role-strain hypothesis, suggesting that an increased number of work tasks or conflicting expectations between different types of work could affect women's health negatively [16]. As mentioned earlier, domestic strain has also been discussed as a hindrance to return to work with a possible prolonged sick-leave as a result. Some women, however, also showed the reverse result, changing from poor

to good physical health, taking the domestic responsibility into account. An interpretation of this finding could be that even if responsibility for domestic work was high, a continuous longer sick-leave period could offer possibilities of spending more time with family and friends and gaining positive influences on self-rated physical health. Such an interpretation is in line with findings by Floderus and colleagues [115] and could also indicate support for the role-enhancement hypothesis.

In an earlier study, women reported more positive consequences regarding friendship relations, lifestyle and psychological well-being than did men when sick-listed with a psychiatric diagnosis [115]. No information on self-perceptions of the sick-leave period was available in present study, but results for women with a psychiatric disorder at baseline showed higher ORs for belonging to the positive change category. This could be interpreted as a positive effect of sickness absence related to a decrease in strain which might be influenced by a combination of paid and unpaid work, and might be more burdensome for women with psychiatric diagnoses. Another possibility is that experience of psychiatric illness may have led to adequate treatment which also, even if not specifically intended, had a beneficial effect on somatic illness.

However, several methodological issues need to be considered in a study where sickness absence is seen as the independent variable, and the results should be seen as an attempt to explore possible consequences of sickness absence. The natural course and consequences of the illness/disease or injury itself are not well-known for the major sick-leave diagnoses and separating the effect of the specific disease (which could have caused the sick-leave) from the effect of experience of sick-leave itself is a major problem unresolved.

7.7 A framework for a multidimensional assessment of domestic work

As shown in the introduction (Figure 1), paid work and domestic work are interrelated, but due to the lack of knowledge on domestic work per se and its association to health the focus of this thesis was specifically to scrutinize domestic work. During the work with papers included in this thesis it became clearer that the concept domestic work itself needs a closer description and typology. Below a suggestion of a typology is presented (Figure 2), and the conceptual content elaborated in order to move this research area further in understanding, assessment and explanations.

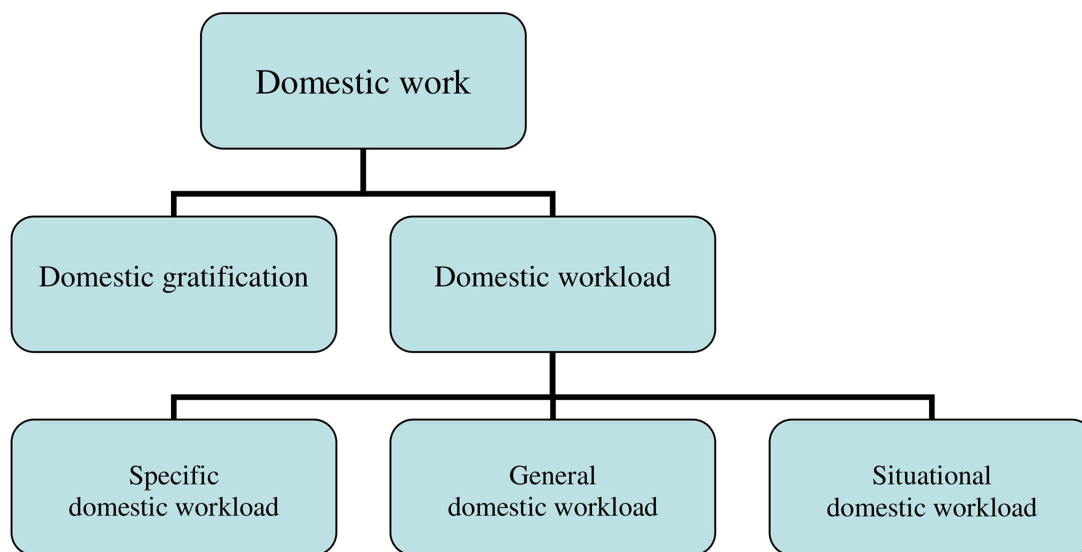

Fig. 2 A typology of domestic work and its different dimensions

The suggestion is that domestic work is seen as an overall concept that consists of different dimensions. The conceptual content of domestic work is that it is work performed outside the paid labour market and that it is mainly unpaid in monetary means, and activities are directed to maintenance of household, family or extended

family and that different work tasks are carried out with different levels of physical, emotional, cognitive and social engagement.

Domestic work constitutes in the suggested typology of two main dimensions namely domestic gratification and domestic workload. Those dimensions can be seen as subjective and emotive but in two different directions. The concept domestic gratification includes those parts of the domestic work that are experienced and perceived as energy contributing or rewarding in different ways. The linguistic meaning of the word gratification is: ”thing that gives one pleasure or satisfaction” [165]. An illustration from the *Oxford advanced learner's dictionary of current English*, put's the finger on the spot in understanding domestic gratification: “One of the few gratifications of an otherwise boring job” [165]. There are boring and less boring parts of the domestic work and also embedded in the complexity of domestic work is the notion that certain work tasks could be perceived as both demanding and gratifying. For example, a thorough house-cleaning is not often something anticipated with pleasure, but afterwards it could give a great feeling of contentment. Arranging a birthday party for a child could take a lot of effort, but might also give feelings of satisfaction and enjoyment. Giving support to an adult in need of care could be both physically and emotionally demanding but at the same time afford opportunities for a closer and more confident relationship. What will be the notion of different work tasks will also depend on contextual factors, such as possible social support, economic situation and housing facilities.

The other dimension is the concept domestic workload, which is intended to include factors of domestic work that are or could be perceived as loading or demanding. The focus of the included papers was the dimension of domestic workload. During the work with this thesis it appeared that domestic workload

could be divided into sub dimensions. The three suggestive dimensions are: general domestic workload, specific domestic workload and situational domestic workload (Figure 2).

The conceptual content of general domestic workload is demands arose through domestic work tasks and their administration, parental responsibility for children and domestic negotiation of work tasks and responsibility distribution between cohabiting partners. Thus it can consist of those every-day life tasks such as, cooking, laundry, shopping etc. Not only to perform the tasks, but also to take responsibility for them are part of the general domestic workload. General domestic workload also includes the normal workload associated with having children. For those co-habiting, workload, at least in the Swedish cultural context of equity has to be negotiated, distributed and divided within a relation that could be of different quality when it comes to things such as love, empathy, gender equity, social status, economy and so on.

The conceptual content of specific domestic workload is demands containing additional and non-occasional work tasks that have to be carried out in relation to children or adults with extra needs. These work tasks can be needed to carry out for a shorter or a longer period in life. Due to type of work tasks this part of domestic workload is presupposed to involve physical as well as emotional engagement to a large extent. By conducting specific domestic workload, such as often caring for temporarily ill children, or caring for children with long lasting or chronic disease or disability as well as caring for an adult or providing regularly support to others, additional work demands are put on to those coming from the general domestic workload.

The conceptual content of situational domestic workload is that particular domestic events or difficulties may occur as or in certain situations in life. Depending on what event or situation that may occur, this could add considerably to the general domestic workload and embracing physical, emotional or social aspects. Examples of such events or difficulties are serious illness or death of a family member, experience of a child exposed to abuse, separation/divorce or financial problems.

An application of the typology on the studies done on domestic workload in this thesis is presented in table 8 and can further illustrate the conceptual content and empirical assessments of the different dimensions.

Table 8. Measurements used in the thesis and their conceptual belonging to domestic workload and its sub dimensions.

DOMESTIC WORKLOAD

General domestic workload	Specific domestic workload	Situational domestic workload
Domestic job strain	*Caring activities related to children*	*Domestic life events or difficulties*
(Lack of) Domestic work equity and marital satisfaction	- Temporarily-ill child/children (more than average)	- Financial problems - Separation/divorce - Serious illness/disease of a family member
Parental responsibility	- Children with special needs	- Child exposed to abuse (violent or sexual)
- Children's age - Number of children	- Children with disability or disease - Take care of someone else's child/children	- Death of a close relative - Death of a close friend
Domestic responsibility - Responsibility for home - Responsibility for children	*Caring activities related to adults*	
	- Caring for an adult - Regular visit to an adult - Regular support to others	

The sub dimensions of domestic workload presented in table 8 could make up an attempt for a ‘think-table’ on what could be important to consider in research on domestic work, health and sickness absence.

As mentioned in the introduction paid and unpaid work is interrelated and, these different arenas are also influencing each other in women’s daily lives. As a result of this thesis it is possible to add some new concepts to the figure presented as Figure 1.

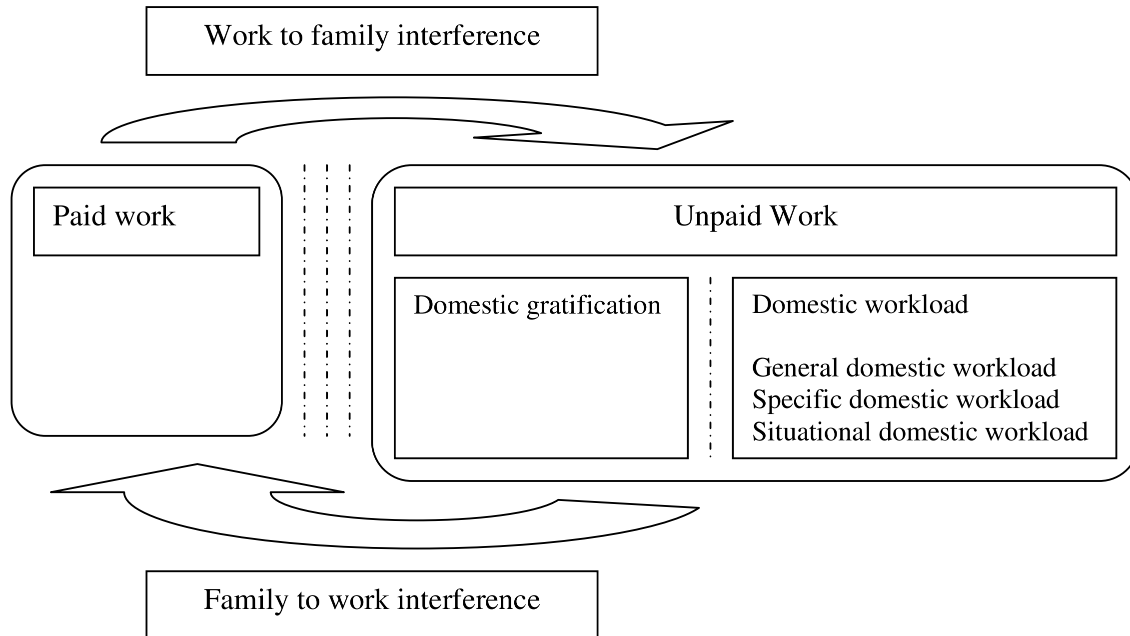

Figure 3. An extended model over the interplay between paid and domestic work and its different dimensions.

Paid and domestic work are central parts in most people's lives', and much time is spent working at work and at home. Not only time spent in the meaning of hours, but also our thoughts, mind and feelings are often occupied around these two areas. Additionally, the interference, where children often are a main aspect, between the two parts, need to be sorted out in a successful manner. Thus a highly complex picture in what context women in modern societies live their lives appear where paid work, domestic work and the interplay between these two areas are intertwined. By the input from this thesis the area of domestic work was further elaborated, and it was pointed out that the domestic work contains both a body of workload but also gratifications. By highlighting three sub dimensions of the domestic workload the complexity was further explored.

The impact of domestic workload in this thesis on women's health and sickness absence seemed to be much related to what aspects were examined in relation to which outcome, which gives further support to the need for suggest of a multidimensional way of thinking as well as a comprehensive measurement. In future studies, further dimensions or aspects could be added to the general, specific and situational workload and, by this an even more comprehensive measure of domestic workload, better considering the complexity, can be developed.

8. METHODOLOGICAL CONSIDERATIONS

One limitation is the cross-sectional design in papers I and II and in some of the analyses of paper III; reporting of the different independent variables may pertain to periods both preceding and following the outcomes (dependent variables), which implies that the direction of causality is not possible to disentangle. The results should therefore be interpreted with caution.

There was no available information on demands in domestic work among the non-respondents in WHL and WAG. Earlier studies have found that the association between family demands and negative health effects is stronger among women of low educational level than in women with more education [166]. It is possible that the lower response rate among metalworkers in WHL could have led to an underestimation of the associations between domestic work and self-rated health and sickness absence.

A further limitation is that no tests for validity of the domestic job strain or domestic work equity and marital satisfaction measurements have been made. The internal consistency (Cronbach's alpha) of the items included in domestic work equity and marital satisfaction was 0.61. with some scholars accepting 0.70 (alpha value), while others accept a value of > 0.50 as sufficient and, a lower Cronbach's alpha has also been regarded as sufficient in the early stages of measurement development [167].

The generalisability and representativeness are crucial in epidemiological studies. The occupational groups included in WHL are representing approximately one third of the female paid work force in Sweden, and also cover ages in which the

prevalence of domestic work and multiple roles are high. To make generalisations a large sample is statistical preferable. In research on importance of domestic work and multiple roles it could have been an advantage to have the possibilities to analyses large sample sets such as general population surveys. However, from the angle of representativety, the participants should be selected so that they represent the experience of interest [168], which was achieved in this thesis by including women in age groups with expected high domestic responsibility. Moreover, in large public health surveys seldom detailed questions in a specific area are possible to carry through. Thus a questionnaire more designed for this purpose is a clear advantage and contributes to the strength of the thesis.

For some of the independent variables, the number of individuals exposed was low and the confidence intervals were wide, why carefulness in interpretation is called for. However, in the process of identifying new and different aspects of domestic work, results could be considered as important and useful.

The data were collected over a time span from 1990 to 2000. There is, however, no reason to believe that the associations between domestic work and health or sickness absence should have changed evidently over time. Regarding the domestic work in Sweden, recent reports and studies have only reported minor changes regarding women’s major responsibility for the domestic work [15, 21].

Strength of the data (WHL and WAG) is the high response rate, and the fact that the data includes age groups engaged in both paid and unpaid work. A strength of WHL was the detailed information about different aspects of domestic work and the inclusion of important occupations for the female paid labour force. A further strength was the high quality of the data on sickness absence, gathered from the local insurance offices as well as from employee registers.

Strength of WAG is its longitudinal design, covering women in several age cohorts with a follow up of 5 to 10 years. A main strength was also that the psychiatric diagnoses, set at the interviews, were set according to world wide established manuals for psychiatric disorders as well as the comprehensive face-to-face interviews conducted by professionals in health and social care.

9. MAIN CONCLUSIONS

A crucial question for women's health is disentangling the respective burden of illness/disease associated with paid work, domestic work and the combined effects of both. This thesis is a contribution to knowledge about the parts related to domestic work and multiple roles and experience of sickness absence among employed women in Sweden. Even though these issues are shaped by cultural context the importance of visibility to domestic work and influence on health is of relevance for women cross-culturally. Deeper knowledge about multiple roles in different contexts is also of relevance for women's health.

Several aspects of domestic work were associated with self-rated health and sickness absence. A multidimensional assessment of domestic workload was important for a more comprehensive understanding of the associations between domestic work and health and sickness absence in employed women.

Compared with women who had all three roles women with occupation or a combination of occupation and a partner role had lower odds for negative health outcomes. Support was found for the role strain hypothesis in the cross-sectional analyses of role combinations while neither of the role-strain or role-enhancement hypotheses was supported at the five-year follow-up. Inconsistencies in the findings on different health outcomes point to a need to go beyond simplified expectations of either role strain or role enhancement and examine in more detail the contexts within which roles or combinations of roles are enacted to get further knowledge about the complexity of multiple roles.

The influence of being sick-listed on subsequent health needs to be further explored. There might be separate consequences on health of experiences of sickness absence where different diagnoses and domestic responsibility could be factors of relevance.

There is a need to further explore gender differences in health and research on specific exposures can be a way of moving the knowledge a bit foreword.

10. IMPLICATIONS AND FUTURE RESEARCH

This thesis is a contribution to our knowledge of the importance of specific exposures in women's lives, thus also an elaboration of the complex context in which women in modern societies live their lives. The deepened knowledge on how different dimensions of domestic workload were associated to health and sickness absence and how multiple roles influence health outcomes in women, as well as different consequences of sickness absence are of relevance for public health prevention.

Deeper information on the influence of general, specific and situational domestic workload can also be of importance in women's meeting with health care services and in a rehabilitation process.

Recommendation of best sick-listing practice has been asked for and this thesis contributes to the scares knowledge on how experience of sickness absence might influence subsequent health.

This thesis focused on the domestic work per se, an arena much less researched than paid work, and future research is needed to further disentangle different dimensions and aspects of domestic workload. The interference within the family/household between different members' needs or requirements has not been the focus of research in relation to health problems and sickness absence. Very little is known about the importance of women's 'manager role' including logistic responsibilities in carrying through the need for an updated schedule as well as the importance of adjustments of own time and needs. For example the aspect of a physical and emotional stand-by function is poorly known. To continuing the

development of this research area and to achieve an even more comprehensive understanding, future research should pay attention to aspects that could address domestic gratifications that might have positive effects on women's health and sickness absence. Also the role of partners sharing domestic work needs to be further scrutinised in the context of health and sickness absence. A more comprehensive understanding is also needed on how experience of sickness absence influence partners sharing of domestic work and in what way the domestic work influence women's rehabilitations process and return to work.

In future studies it is also important to further monitor the complexity of women and men's daily lives' and multiple roles with the ambition to go beyond simplified expectations of either role strain or role enhancement and examine in more detail the contexts within which social roles or combinations of roles are enacted. Studies on importance of domestic work and multiple roles have by tradition often been addressed to women's situation and sometimes on couples. However, there has been little emphasis on looking on men's experiences on domestic work and multiple roles and tracing its influence on their health and sickness absence. As well, there is a need for research on this subject also including, one-person households, same-sex couples, and enlarged families i.e. 'network families'.

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