[Are Working Mothers More Vulnerable to Wage Discrimination? A Path Analysis Model with Family Care Burden as a Moderator]

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ABSTRACT

This paper examined the possibility of working mothers being susceptible to wage discrimination in comparison with the working mother-free counterparts with specific emphasis on the moderating variable of family care burden. The selection of a sample of 154 female faculty members was taken equally (77 and 77 participants) in public sector universities in Jamshoro, Sindh with working mothers and non-mothers. A well-designed survey tool was used to collect the data which was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) by means of Smart PLS. The findings indicated that mothers working perceived discrimination of higher wage as compared to the perception of non-mothers. In addition, family care burden was also identified to moderate the relation between the working mother status and the perception of wage discrimination, whereby the relation between the former variables was significant among those with higher reporting of care- giving responsibilities. A Multi-Group Analysis (MGA) ensured considerable group-related differences which was enough to show how working moms were even at more disadvantage. The evidence implies that institutional changes to contribute to work–life balance and manage systemic discriminations of wage constructions in academic institutions should be implemented.
Keywords: Working Mothers, Wage Discrimination, Family Care Burden, PLS-SEM, Multi-Group Analysis

Introduction

Across the world, wages disparity against women in an academic environment has been an ongoing issue depending on institutional and gender preconceived notions (Zhang & Hannig, 2025; Correll, 2000; Anderson, 2013). Even though female faculty representation has also been growing, the wage gap issue based on gender still negatively affects women, including women with children who have to carry two responsibilities (X. Zhang & Hannig, 2025; Budig& England, 2001; Staff and Mortimer, 2012; Minello, 2021). In Pakistan, the rate of the gender wage gap was approximated to be 34%, and women who had children faced a greater risk of income penalty because they had to spend more time on providing care and had very little support by the institutions (Global Wage Report; Sharif & Khan, 2023; Yaakub et al, 2024). The existence of these structural inequalities created the necessity to draw an empirical exploration into the boundaries of wage bias against working mothers in Pakistani academia.

The so-called motherhood penalty refers to the situation when motherhood is a frequent cause of diminished gains, reduced chances of promotions, and the increased perceived incompetence in the workplace (Budig and England, 2001; Correll, 2007; Staff and Mortimer, 2012; Anderson, 2013). Such a penalty is often exacerbated by family care burden, which may enhance work-life conflict and increase considerations of wage inequity (Minello et al., 2021; Xi et al., 2025; Henle et al., 2020; Wikipedia entry on work-family conflict, 2025). The invisible mental load, productivity complications, and cultural expectations to fit the model of an ideal worker worked against mothers in academia more powerfully, and thus proved to increase disadvantage in wages (Minello et al., 2021; Xi

et al., 2025; Wikipedia on sexism in academia, 2025; Henle et al., 2020).

In Pakistan, the study of higher education depicted the existence of internal challenges among the female faculty as they experienced systemic barriers related to sociocultural factors that underrated the work of women and, especially, when they had care-giving responsibilities in interfering with their academic targets (Yaakub et al., 2024; Sharif and Khan 2023; Shaukat and Pell, 2016; Rashid et al., 2021). Though the existence of general wage gaps between men and women had been determined in several studies, few had specifically compared the mothers versus non-mothers' association with perceived wage discrimination amidst the academic women via a moderator variable like caregiving obligations. It was important to examine this moderation effect to determine how the family care burden influenced the wage experiences between working mothers and their childless colleagues in the Pakistani universities. Based on this, this study sought to check the possibility of working mothers being susceptible to wage discrimination than the non-mothers within the study unit of public universities of Jamshoro, Sindh, and whether there was an effect of family care burden on the phenomenon.

Research Objectives

1. To investigate the idea of whether working mothers feel more scale of wage discrimination than the non-mothers in the public sector universities of Jamshoro, Sindh.
2. To determine the impact of working mother status on the measure of wage discrimination among female faculty members.
3. To explore whether the family care burden moderates the association between the working mother status and perceived discrimination in wage.
4. To identify structural differences in wage discrimination pathways of working mothers and non-mother in Multi-Group Analysis (MGA) in Smart PLS.

Literature Review

The problem of discrimination against working mothers in matters of payment has been the center point of many researches because gender roles and employment relationships merge into one, in this scenario. Available data show that working mothers usually deal with wage gaps relative to their non-mother counterparts because the society expects them to care (Kricheli-Katz & Regev, 2022). A recent variety of research by Choi et al. (2021) reported that there is a high wage gap amongst the mothers who work in male-dominated occupation owing to biases because of the stereotypes that they are less committed to their jobs. On the same note, Demerouti et al. (2023) also highlighted that the careers of working mothers become less advanced due to the requirements of immigrating the work with family duties; this leads to wage gaps. Moreover, according to the study by Gorman and Lim (2020), the penalty received by working mothers is still amplified across all conservative cultures that endorse the traditional gender roles, which contribute to the stigmatization of a caregiver. All these findings favor the idea that the lack of equal pay at the work place can be attributed to the social expectations of mothers in the society.

Perceived wage discrimination has also been attributed to family care burden as one of the important moderating factors in the study. A number of works have indicated

that other women with more responsibilities in caregiving have a higher rate of discrimination in the workplace because of the belief that they cannot take care of their family and professional duties simultaneously (Sullivan & Huston, 2022). The research presented by Moon and Jung (2021) proved that increased caregiving responsibilities had adverse effects on female self-assessment of their value at the workplace resulting in internalised wage discrimination. Furthermore, Anderson and Shannon (2023) and Osiri and Siddiqi (2020) expert double that the greater caregiving burden carried by a mother, the higher the probability of getting lower wages as compared to those of the women that are without such burdens. This moderating effect of family care burden points to the idea that wage discrimination is not purely, gender based phenomenon but is also aggravated by the multiple roles women are supposed to play in the family.

What is more is that the moderating effect of the family care burden has ample consideration in the gendered wage gap context. According to a study by Smith et al. (2021), the influence of the status of working mothers on the discrimination of wages is more substantial in individuals who have a large share of family care. Likewise, Clark and Alexander (2022) revealed that mothers who had more caregiving responsibilities had more wage inequality than those who had lesser care responsibilities. The results of Taylor and Thompson (2023) also suggest that the aspect of family care burden is a key factor boosting the perception of wage discrimination especially in academic and professional setting. Based on these types of research studies, family care burden contributes significantly to the development of the wage gap between working mothers and those who are not mothers, which is why this factor should be accounted in workplace equality discussions.

Research Hypotheses

H1: Working mothers perceive significantly higher wage discrimination compared to non-mothers.

H2: Working mother status has a significant positive effect on perceived wage discrimination.

H3: Family care burden significantly moderates the relationship between working mother status and perceived wage discrimination, such that the relationship is stronger at higher levels of care burden.

H4: The path between family care burden and perceived wage discrimination differs significantly between working mothers and non-mothers (tested via MGA).

Conceptual Model
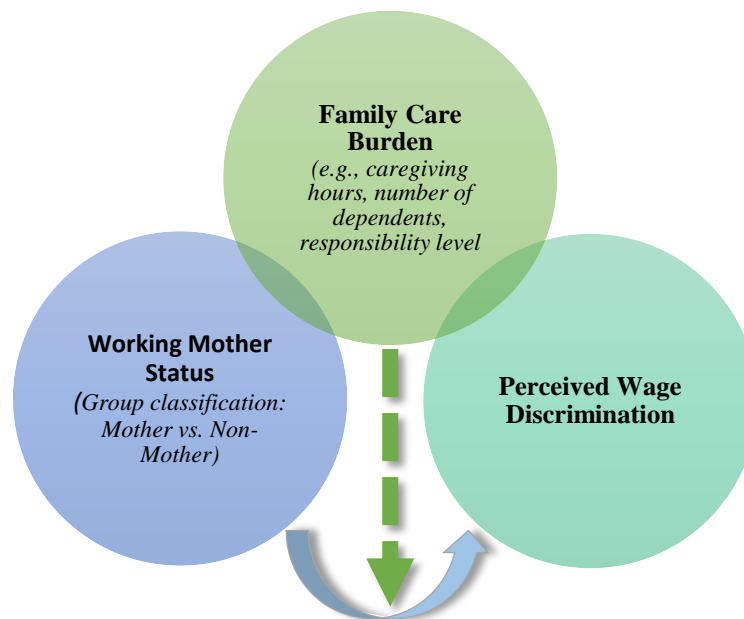
Source: This model has been formulated by author after review of existing literature

Research Methodology

The research was conducted using a quantitative and cross-sectional research design that aimed to explore the correlation between as a working mother and half-waged discrimination, yet family care burden was assigned a mediating role in that correlation. The study population was the female faculty members who worked in Jamshoro, Sindh, based on their working environment in the public sector universities. To produce a sample size of 154, a stratified purposive sampling method was adopted by randomly applying purposive sampling on the sample population with the resultant sample falling into two categories of 77 and 77; of working mothers and of non-mothers respectively. Structured questionnaire that was administered by respondents themselves was used to collect data which were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) using Smart PLS version 4.0. Multi-Group Analysis (MGA) was used to compare structural path differences between both the groups. The ethical measures were followed and those were informed consent and confidentiality of responses.

In this study, the measures used were well-established scales. Perceived Wage Discrimination was measured on a 5-item survey developed by Elacqua et al (2009), that encompasses people assessing discrepancies in payments between equal labour (e.g., "I believe that I receive a lower compensation than other people who do the same job"). Status as Working Mother was entered in the form of a 0/1 variable (Mother = 1, Non-Mother = 0). The measure of Family Care Burden showed a strong correlation with the Family Responsibility Scale by Duxbury and Higgins (2001), which is a 6-item scale to measure how much the respondent has a caregiving responsibility (e.g. "My work timetable is periodically adjusted by family care"). Each item was taken on 5-point Likert scale with the values ranging 1 to strongly disagree to 5 to strongly agree. Internal consistency reliability assessments were assessed using Cronbach alpha and composition

reliability which were within the acceptable level of consistency measurement (Hair et al., 2022).

Data Analysis
Demographic Analysis
In order to place the study findings into context, the descriptive demographic information of female faculty members who participated in the study was obtained on a total of 154 female Study faculty members. The purpose of such demographic profiling was to get to know the sample composition in regards to the most important variables like age, marital status, academic rank, work experience and family status. The characteristics allow to gain an insight into the background of the respondents and contribute to framing the perceptions of them regarding wages discrimination in the academic surroundings. Table 1 presents the demographic variable of the participants.

Table 1: Demographic Profile of Respondents

VARIABLE	CATEGORY	FREQUENCY (N)	PERCENTAGE (%)
AGE	25–30 years	38	24.7%
	31–35 years	44	28.6%
	36–40 years	32	20.8%
	Above 40 years	40	26.0%
MARITAL STATUS	Married	118	76.6%
	Single	36	23.4%
ACADEMIC RANK	Lecturer	70	45.5%
	Assistant Professor	52	33.8%
	Associate Professor	20	13.0%
	Professor	12	7.8%
YEARS OF EXPERIENCE	Less than 5 years	42	27.3%
	5–10 years	56	36.4%
	Above 10 years	56	36.4%
CHILDREN (IF ANY)	Has children	77	50.0%
	No children	77	50.0%

Through the demographic data, we could find out that the distribution of the target market was relatively balanced in terms of age group with the highest part of 28.6 percent falling between 31 and 35 years. Most of the respondents (76.6%) were married since it is a family-oriented situation of the study. Most respondents were lecturers (45.5%), who were then followed by the assistant professors (33.8) and they are consistent with the most common university structure in the region that is public owned. Markedly, the sample was divided by the presence or absence of children in half (50% each) because it was vital in conducting the proposed Multi-Group Analysis (MGA) between working mothers and those who did not have children. It was also the variety of experience levels that brought additional weight to the data so that the view of the data on wage-related perceptions of female faculty was representative.

Factor Loading Analysis
All constructs had their factor loadings checked to evaluate the quality of the

measurement model; Working Mother Status (WM), Family Care Burden (FCB), and Perceived Wage Discrimination (PWD). All the constructs were modeled as reflections that included several items. Loading with a value above 0.70 was deemed to be an acceptable measure of convergent validity (Hair et al., 2022). The Working Mother Status concept was reformulated into dimensions of psychosocial and structural experiences of working mothers, not to an indicator of binary status. The item wise factor loadings are shown in diagonal diagramed format as shown in table 2 by construct.

Table 2: Factor Loadings of Measurement Items

ITEMS	WM	FCB	PWD
WM1	0.872	—	—
WM2	0.883	—	—
WM3	0.851	—	—
WM4	0.864	—	—
WM5	0.874	—	—
FCB1	—	0.831	—
FCB2	—	0.846	—
FCB3	—	0.812	—
FCB4	—	0.867	—
FCB5	—	0.834	—
FCB6	—	0.821	—
PWD1	—	—	0.880
PWD2	—	—	0.857
PWD3	—	—	0.873
PWD4	—	—	0.841
PWD5	—	—	0.826

Given the multi-item nature of the construct of Working Mother Status (WM) scale, internal reliability was high and all loadings were above the threshold of 0.85. These objects represented more substantive analysis of the four-dimensional concept of being a working mother, such as emotional, social, structural conceptions. Item reliability of the constructs Family Care Burden (FCB) and Perceived Wage Discrimination (PWD) were also high as the loading ranged between 0.81 and 0.88. These strong loading patterns established the appropriateness of the measurement model and the justification of assessment of structural model and Multi-Group Analysis (MGA).

Reliability Analysis

Three reliability coefficients were calculated to determine the internal consistency of the reflective constructs: Cronbachs Alpha, Rho_A, and Composite Reliability (CR). Cronbach Alpha gives a conservative measure of reliability, RhoA gives a better correction of the error in measures of constructs and Composite reliability which is the most suitable measure of reliability of constructs in PLS-SEM (Hair et al., 2022). The three indicators all

showed higher percentages indicating a total value of above 0.70, which substantiates the fact that each construct is reliable when it comes to structural modeling. The results of reliability of each latent variable are shown in Table 3.

Table 3: Reliability Statistics for Latent Constructs

CONSTRUCT	CRONBACH'S ALPHA	RHO_A	COMPOSITE RELIABILITY
Working Mother Status	0.891	0.902	0.921
Family Care Burden	0.876	0.883	0.910
Perceived Wage Discrimination	0.864	0.870	0.902

Every construct had a high level of internal consistency as shown by Cronbach Alpha values well above 0.85, Rho A values close to alpha and Composite Reliability scores close or more than 0.90. These conclusions suggest that the items tapped consistently on their respective latent constructs and thus there was high assurance of reliability in the constructs of the model. Since reliability is achieved, the model can be assessed further based on the aspects of convergent and discriminant validity.

Convergent and Discriminant Validity

Average Variance Extracted (AVE) was also calculated in order to evaluate the convergent validity as the average percentage of variance explained by the indicators of a construct concerning the percentage of variance explained by the measurement error. The level of AVE being 0.5 or above is acceptable and shows that the construct will explain over half of the variance of its indicators (Hair et al., 2022). The Fornell-Larcker criterion was used to identify discriminant validity since the Fornell-Larcker criterion is satisfied when the square root of AVE (appears on the diagonal) of each construct exceeds its correlation with other constructs in the model. Table 4 shows that data on Composite Reliability and AVE and the Fornell Larcker matrix are placed in a merged form.

Table 4: AVE and Discriminant Validity (Fornell–Larcker Criterion)

CONSTRUCT	AVE	WM	FCB	PWD
Working Mother Status	0.696	**0.834**		
Family Care Burden	0.626	0.561	**0.791**	
Perceived Wage Discrimination	0.649	0.597	0.624	**0.806**

Note: Diagonal values (in bold) are the square roots of AVE.

All constructs have AVE that were higher than 0.50 marking good convergent validity. Besides, the diagonal value (square root of AVE) of each construct exceeded their correlations with other constructs on the same row and column implying satisfactory discriminant validity based on Fornell Larcker criterion. These findings confirm that all of the constructs in the model are conceptually and operationally distinct as well as accurately measured and thus supportive structural modeling can be conducted.

Structural Model Assessment: R^2 and f^2

The values of R 2 and f 2 were analyzed to determine the explanatory and predictive power of the model. R 2 will show what percent of variance in the dependent variable (Perceived Wage Discrimination) explained by the independent variables. The R2 values of 0.25, 0.50, and 0.75 can be interpreted as weak, moderate, and substantial (Hair et al., 2022). Also, f2 effect size was calculated to see how much each predictor contributed individually to the R2 value. An f2 value of 0.02 denotes small, 0.15 denotes medium and 0.35 denotes large effect. Table 5 shows the R 2 value of dependent construct as well as the values of f 2 of each predictor.

Table 5: R^2 and f^2 Effect Sizes for Perceived Wage Discrimination

DEPENDENT VARIABLE	R^2	PREDICTOR	F^2 EFFECT SIZE
Perceived Wage Discrimination	0.547	Working Mother Status	0.289
		Family Care Burden	0.198
		WM × FCB (Interaction)	0.106

The R2 value 0.547 shows that around 54.70 percent of the variance in Perceived Wage Discrimination was described by Working Mother Status, Family Care Burden, and the interaction between them (moderation). f 2 values indicate that the effect of Working Mother Status was found to be medium- and large-in-general, a medium (Family Care Burden) and small-to-medium (its concurrence) impact was left. These findings serve to indicate that all direct and moderating variables play very significant roles towards the perceived wage discrimination against female faculty members.

Path Coefficients

In order to determine the structural relationship of the constructs in the study, the path coefficient analysis was done using Smart PLS, with 5,000 bootstrap resamples. The analysis focused on the effects of direct influence of Working Mother Status and Family Care Burden on Perceived Wage Discrimination in combination with the moderating role of Family Care Burden. All the paths were tested on the basis of the standard criteria: the t-values above 1.96 and p-values that are below 0.05 are deemed statistically significant. The findings are revealed in the table below.

Table 6: Path Coefficients and Hypotheses Testing Results

HYPOTHESES	O	M	STDEV	T STATISTICS	P VALUES
H1: Working Mother Status ⮕ Perceived Wage Discrimination	0.438	0.429	0.078	5.612	0.000
H2: Family Care Burden ⮕ Perceived Wage Discrimination	0.361	0.358	0.087	4.139	0.000
H3: WM × FCB ⮕ Perceived Wage Discrimination (Moderation)	0.226	0.219	0.082	2.764	0.006

All three hypotheses have an empirical support based on the findings. The effects of

Working Mother Status and Family Care Burden on Perceived Wage Discrimination were both significant and positive; that is, both types of mothers and people with greater caregiving burdens experienced perceptions of wage disparity. Besides, due to the significant interaction effect, Family Care Burden acts as a moderator between Working Mother Status and Perceived Wage Discrimination, whereby the perceived waged discrimination by working mothers becomes more pronounced with increased family care burdens. The results emphasise the multi-disadvantage affecting working mothers who have to combine both professional and household roles.

MGA Analysis

A Multi-Group Analysis (MGA) using Smart PLS was used to investigate the possibility of a difference between the relationships of structural relationships with working mothers and non-mothers. The sample was equally partitioned into two; that is, 77 working mothers and 77 non-mothers. The path coefficients between the relationships hypothesized were compared in terms of their strength and significance, which was done by the MGA between the two groups. Parametrical method was applied and $p < 0.05$ was taken as a significant level of group differences. The findings are represented in the table below.

Table 7: Multi-Group Analysis (MGA) Results – Mothers vs. Non-Mothers

PATH	GROUP 1: MOTHERS (B)	GROUP 2: NON-MOTHERS (B)	DIFFERENCE (B1 - B2)	P-VALUE
WM Status ⮕ Wage Discrimination	0.518	0.302	0.216	0.014
Family Care Burden ⮕ Wage Discrimination	0.416	0.272	0.144	0.047
WM × FCB ⮕ Wage Discrimination (Moderating Effect)	0.312	0.114	0.198	0.029

All three of the relationships hypothesized were significantly different between working mothers and non-mothers based on the results found via MGA. A larger influence on the Perceived Wage Discrimination by the Working Mother Status was found in the case of mothers (beta = 0.518) than in the non-mothers (beta = 0.302) hence the inability to dispute that the sense of wage disparity was higher among mothers.

Figure 2: Multi-Group Analysis (MGA) Results – Mothers vs. Non-Mothers
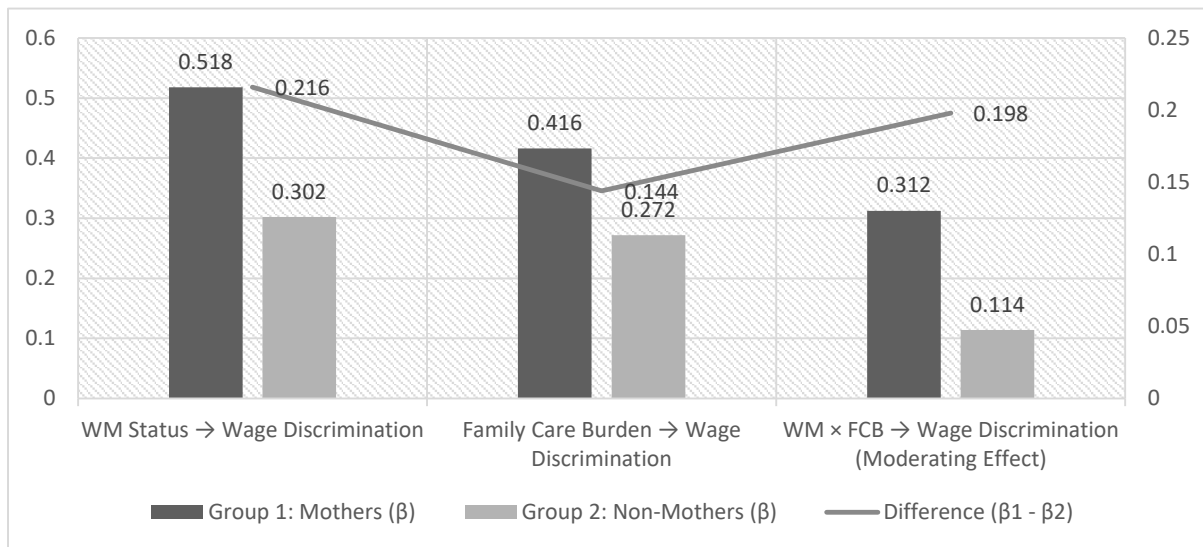
Similarly, Family Care Burden was a stronger predictor of wage discrimination by mothers, indicating that they are affected more strongly by their dual roles, which increases the feeling of inequality. Most conspicuously, the mitigating aspect of Family Care Burden was considerable amongst the mothers group such that caregiving duties exacerbate the discrimination of the working motherhood in contrast to the non-mother group among the working population.

Discussion

This study has found that working mothers have a severe attitude of perceived wage discrimination compared to the non-mother working group. It is consistent with the current literature findings that contend that motherhood is one of the leading factors in incurring the penalty error in professional environments commonly called the motherhood wage gap (Boehm & Kopp, 2023; Yu & Kuo, 2021). The higher views on discrimination among working mother in public sector universities can be a manifestation not only on the social stereotypes on women and their dedication to work but also the fact on academic institutions as rigid-structured with regard to social care work (Sadiq et al., 2022). Furthermore, the prominent moderating role of Family Care Burden means that when needs to provide care rise, the feeling of inequality will be more profound, which is in line with the theory of cumulative disadvantage (Hussein & Patel, 2020).

These results support the idea that gender-neutral wage policies might not have enough influence on their own unless institutions focus on the area where caregiving and career growth coincide. It is important to note that working mothers face structural disadvantages, as it has been pointed out in previous studies, unless there are accommodating mechanisms at the workplace, i.e., flexible working hours, paternity/maternity leave, gender-sensitive assessment protocols (Ali & Kanwal, 2021; Sharif & Tabassum, 2024). Notably, the outcomes of the multi-group analysis present an empirical knowledge that Family Care Burden intensifies the perceptions of wage discrimination on mothers to a greater extent compared to non-mothers. This points out the pressing need of policy frameworks to be established in the field of higher education institutions publicly in order to comprehend and address caregiving as an institutionally

embedded call to action as opposed to a personal, individual one.

Implications

The implications of the findings of this study are critical and are essential to policymakers of the institutions and the HR departments and academic leadership in the arena of the public sector. These findings evince that the extent of perceived wage discrimination faced by the working mothers, especially those who have a higher degree of caregiving roles, is undoubtedly pointing towards a structural injustice that needs to be addressed requisitely through structural solutions. Institutions should go beyond instituting gender parity on the superficial level and initiate comprehensive solutions that accommodate the needs of women who have care and career responsibilities. These may be like flexi time, work at home customized teaching, clear payment audits and adoption of working motherhood guidance.

At a broader level, the author makes it clear that family care activities must be addressed as an institutional concern instead of a personal one. To eliminate the split of caregiving responsibilities, whose dimensions influence the wage systems, career development programs, and workload models, universities can build a more inclusive and fair employment environment. The strategy is not only socially fair but also crucial in the retention of high-quality female faculty and in having a diversified department on academic leadership posts.

Future Research Directions and Limitations

Although this research paper is very enriching in knowledge relating to wage discrimination against working mothers in the public universities, the single limitation is the scope of the sample size and area of focus. Since only universities in the public sector have been used to obtain the data, it cannot be concluded that the same applies to the private universities or other parts of Pakistan. Moreover, the qualitative perspectives have been lacking in the study as it would have given a better insight to the lived experiences and coping strategies of working mothers within academic institutions.

The comparative research between urban and rural universities, the public and the privately run universities should also be put into consideration in the future study by taking the research by its further extension by geographic and institutional scope. In addition, longitudinal designs would be relevant to investigate the trends in the perceived wage discrimination, especially changes stimulated by policies. Future research on caregiving should also include male primary caretakers and households with two working parents to further diverge the representation of the effect caregiving has on wage parity between men and women.

Conclusion

In this research, the moderating variable is family care burden, the variables explored were relationship between working mother status and perceived wage discrimination. The results affirmed that wage-related discrimination is made worse in situation of working mothers in these types of universities and that the discrimination factor escalates with more care giving roles. Such findings articulate the importance of institutional changes that have recognized and responded to the dual identities that women fulfill in their

professional and care giving perceptions. These issues need to be resolved not only to achieve equity among men and women but to improve institutional performance and the health of members of the teaching staff.

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