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Impact of Household Workload on Girls' Academic Performance in Secondary Schools in the Benadir Region Mogadishu Somalia

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Abstract

Household workload is a critical yet often overlooked factor influencing girls' academic performance, particularly in contexts where gendered domestic responsibilities are deeply embedded in social norms. This study examined the impact of household workload on girls' academic performance in secondary schools in the Benadir Region, Somalia. The study focused on three key dimensions: time spent on household chores, physical and mental fatigue resulting from household work, and the gendered distribution of household responsibilities. A quantitative research approach using a descriptive survey design was adopted. Data were collected from 255 female secondary school students selected through simple random sampling, and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings indicated that time spent on household chores had a significant effect on academic performance ($\beta = 0.315$, $p < 0.05$), while the gendered distribution of household responsibilities emerged as the strongest predictor ($\beta = 0.533$, $p < 0.05$). However, physical and mental fatigue did not show a statistically significant direct effect ($\beta = 0.063$, $p > 0.05$). The model explained 72.0% of the variance in academic performance ($R^2 = 0.720$). The study concludes that girls' academic outcomes are strongly shaped by time demands and gendered expectations within households, and recommends gender-responsive policies, school support systems, and equitable domestic practices.

Introduction

Gender inequality in education remains a persistent global challenge, particularly in contexts where socio-cultural norms and household expectations disproportionately affect girls' learning experiences (Unterhalter & North, 2017). Although international efforts have emphasized educational equity, girls in many low-income and fragile settings continue to face structural barriers that undermine their academic performance (Kabeer, 2016). Among these barriers, household workload—often referred to as invisible labor—has emerged as a critical yet underexamined factor influencing girls' educational outcomes (Ferrant, Pesando, & Nowacka, 2014). Invisible labor includes unpaid domestic responsibilities such as cooking, cleaning, childcare, and household maintenance, which are frequently assigned to girls based on gendered expectations rather than educational priorities (Bianchi et al., 2012).

Contemporary educational and gender research increasingly acknowledges that academic performance is shaped not only by school-based factors but also by home environments and family responsibilities. In many societies, girls are expected to contribute significantly to household labor alongside their schooling, creating competing demands on their time and energy (Gurmu & Etana, 2014). Studies conducted across developing regions indicate that excessive time spent on household chores reduces girls' study time, increases fatigue, and limits meaningful engagement with academic tasks (Duflo, Dupas, & Kremer, 2021; Levison, Moe, & Knaul, 2001). These challenges are particularly pronounced at the secondary school level, where academic demands intensify and sustained concentration becomes essential for academic success.

The literature further highlights that household workload is a multidimensional construct rather than a singular experience. Time spent on household chores directly reduces the time available for homework, revision, and rest (Ilahi, 2001). In addition, physical and mental fatigue resulting from prolonged domestic work has been shown to impair students' concentration, memory, and classroom participation (Basch, 2011; Mullis et al., 2019). Beyond time and fatigue, the gendered distribution of household responsibilities reinforces unequal expectations within families, where girls are systematically assigned more domestic tasks than boys (Bredtmann, Otten, & Rulff, 2018). This gender-based allocation of labor not only increases workload intensity but also normalizes the prioritization of household duties over girls' educational needs.

Central to understanding how household workload affects educational outcomes is the concept of academic performance. Academic performance encompasses students' ability to complete assignments, maintain regular attendance, concentrate during lessons, and achieve satisfactory examination results (Richardson, Abraham, & Bond, 2012). Educational research consistently demonstrates that students' academic performance declines when learning time is constrained and physical or mental exhaustion is persistent (Credé & Kuncel, 2008). For girls burdened with heavy domestic responsibilities, these constraints can accumulate over time, resulting in lower academic achievement and reduced educational progression (Heissel, Adam, Jensen, & Walter, 2017).

Despite growing scholarly attention to gender and education, significant gaps remain in the empirical literature on household workload and girls' academic performance. Many existing studies treat household workload as a single variable, without disaggregating its distinct dimensions or examining their individual effects on academic outcomes (Gershuny & Sullivan, 2019). Moreover, much of the available evidence is derived from generalized national or rural contexts, with limited focus on urban and post-conflict settings. There is also insufficient empirical clarity on how household workload—particularly time demands and fatigue-related pressures—independently influence girls' academic performance beyond time and fatigue considerations (Bredtmann et al., 2018).

Within the Somali context, these challenges are particularly salient. In fragile and post-conflict urban environments, economic hardship and entrenched gender norms intensify reliance on girls' unpaid domestic labor within households, often at the expense of their schooling (Justino, Leone, & Salardi, 2014). While access to secondary education for girls has improved in recent years, concerns persist regarding academic performance, attendance, and sustained engagement. However, there is limited systematic evidence examining how time spent on household chores and fatigue arising from household work shape girls' academic outcomes in this context.

In response to this unresolved gap, the present study examines the impact of household workload on girls' academic performance in secondary schools in the Benadir Region. The study conceptualizes household workload as a multidimensional construct comprising time spent on household chores, physical and mental fatigue resulting from household work, and the gendered distribution of household responsibilities. By empirically testing the effects of these dimensions on girls' academic performance,

the study seeks to contribute to the growing body of literature on gender, education, and invisible labor, while providing evidence-based insights to support policies and interventions aimed at improving girls' educational outcomes in secondary schools.

Research Objectives

To examine the effect of time spent on household chores on girls' academic performance in secondary schools.

To assess the effect of physical and mental fatigue resulting from household work on girls' academic performance.

To determine the effect of gendered distribution of household responsibilities on girls' academic performance in secondary schools.

Research Hypotheses

H1

Time spent on household chores is significantly associated with girls' academic performance

H2

Physical and mental fatigue resulting from household work is significantly associated with girls' academic performance

H3

Gendered distribution of household responsibilities is significantly associated with girls' academic performance.

The conceptual relationships among the study variables are illustrated in Fig. 1.

Figure 1 presents the conceptual framework guiding the study, illustrating the hypothesized relationships between household workload dimensions and girls' academic performance in secondary schools. The framework conceptualizes household workload as a multidimensional construct comprising time spent on household chores, physical and mental fatigue resulting from household work, and the gendered distribution of household responsibilities. These dimensions are proposed as key factors associated with girls' academic performance, in line with the study's research objectives and hypotheses (H1–H3).

Literature Review

Household Workload and Girls' Education

Household workload has increasingly been recognized in educational and gender research as a critical home-based factor influencing girls' schooling and academic outcomes, particularly in low-income and fragile contexts (Ferrant et al., 2014; Kabeer, 2016). Household workload, often conceptualized as invisible or unpaid domestic labor, encompasses activities such as cooking, cleaning, childcare, water collection, and family caregiving (Bianchi et al., 2012). These responsibilities are frequently assigned to girls due to entrenched gender norms, positioning them as primary contributors to domestic labor from an early age (Gershuny & Sullivan, 2019). Educational scholars argue that such gendered expectations systematically disadvantage girls by constraining their time, energy, and cognitive resources necessary for effective learning and academic success (Unterhalter & North, 2017).

From a theoretical standpoint, the relationship between household workload and academic performance is grounded in time allocation theory and gender role theory. Time allocation theory posits that individuals have finite time resources, and excessive engagement in non-academic activities reduces time available for learning-related tasks (Becker, 1965; Ilahi, 2001). Gender role theory further explains how culturally constructed expectations assign domestic responsibilities disproportionately to girls, reinforcing unequal educational opportunities (Eagly & Wood, 2012). Together, these perspectives provide a framework for understanding how household workload functions as a structural barrier to girls' academic achievement rather than a matter of individual choice or ability.

Empirical studies conducted across Sub-Saharan Africa, South Asia, and other developing regions consistently demonstrate that girls with heavier domestic responsibilities exhibit lower academic performance, higher absenteeism, and reduced educational engagement (Levison et al., 2001; Gurmu & Etana, 2014; Bredtmann et al., 2018). While these studies establish a general association between household workload and schooling outcomes, scholars increasingly emphasize the need to examine household workload as a multidimensional construct rather than a single, undifferentiated factor (Gershuny & Sullivan, 2019).

Time Spent on Household Chores

Time spent on household chores represents a primary dimension of household workload and a direct constraint on girls' academic engagement. This dimension refers to the number of hours girls dedicate daily to domestic activities before and after school (Ilahi, 2001). Research indicates that extensive involvement in household chores significantly reduces the time available for homework completion, private study, rest, and revision, particularly at the secondary school level where academic demands intensify (Levison et al., 2001; Duflo et al., 2021).

Empirical evidence suggests that girls who spend prolonged hours on household chores are more likely to experience difficulty balancing school responsibilities with domestic expectations (Gurmu & Etana, 2014). Studies have shown that early morning chores and after-school domestic duties disrupt study routines and contribute to delayed homework completion and reduced academic preparedness (Bredtmann et al., 2018). Moreover, time-intensive household responsibilities have been associated with

increased lateness to school and reduced participation in extracurricular academic activities (Ferrant et al., 2014).

Despite these findings, many studies treat time spent on household chores descriptively, without empirically testing its direct effect on academic performance. These limits understanding of the magnitude and direction of its influence, particularly when examined alongside other dimensions of household workload (Gershuny & Sullivan, 2019).

Physical and Mental Fatigue from Household Work

Physical and mental fatigue constitutes a critical but often overlooked dimension of household workload. Prolonged domestic labor, especially tasks requiring physical exertion or sustained attention, has been shown to result in chronic tiredness, reduced concentration, and cognitive exhaustion among school-going girls (Basch, 2011). Educational psychology literature emphasizes that fatigue negatively affects memory retention, attention span, and classroom engagement, all of which are essential for academic performance (Credé & Kuncel, 2008).

Studies examining fatigue among students engaged in household labor report that physically exhausted learners struggle to remain alert during lessons and are less responsive to instructional activities (Heissel et al., 2017). Mental fatigue, resulting from continuous responsibility and stress associated with household duties, further exacerbates these challenges by impairing motivation and academic confidence (Mullis et al., 2019). For girls, the cumulative effects of physical and mental fatigue can translate into persistent academic underperformance (Basch, 2011).

Although fatigue is frequently mentioned as a consequence of household workload, relatively few empirical studies isolate it as an independent analytical dimension. As a result, its specific contribution to girls' academic performance remains insufficiently examined, particularly within secondary education contexts (Credé & Kuncel, 2008).

Gendered Distribution of Household Responsibilities

The gendered distribution of household responsibilities refers to the unequal allocation of domestic tasks based on gender, whereby girls are expected to assume a greater share of household labor than boys (Bianchi et al., 2012). This dimension reflects broader social norms that prioritize girls' domestic roles over their educational development (Eagly & Wood, 2012). Gender scholars argue that such expectations reinforce systemic inequalities by normalizing educational sacrifice among girls while protecting boys' study time (Unterhalter & North, 2017).

Empirical research indicates that girls in households with rigid gender norms are more likely to experience excessive domestic workload, regardless of their school commitments (Bredtmann et al., 2018). Studies have found that even when boys and girls attend the same schools, girls disproportionately shoulder household responsibilities, resulting in unequal learning conditions (Ferrant

et al., 2014). This gender-based allocation of labor not only increases workload intensity but also shapes girls' perceptions of education as secondary to domestic obligations (Kabeer, 2016).

Despite its relevance, the gendered distribution of household responsibilities is often subsumed under broader workload measures, limiting empirical understanding of its independent effect on academic performance. Few studies explicitly examine how gender-based expectations within households directly influence girls' educational outcomes (Gershuny & Sullivan, 2019).

Girls' Academic Performance

Academic performance is a multidimensional construct encompassing students' ability to attend school regularly, complete assignments, concentrate during lessons, and achieve satisfactory examination results (Richardson et al., 2012). Educational research consistently demonstrates that academic performance is influenced by both school-based and home-based factors (Credé & Kuncel, 2008). For girls burdened with household responsibilities, academic performance is particularly vulnerable to disruptions in study time, rest, and cognitive readiness (Basch, 2011).

Studies focusing on gender disparities in academic achievement highlight that girls' performance often declines when learning environments extend beyond the classroom into demanding household contexts (Heissel et al., 2017). Reduced study time, increased fatigue, and irregular attendance collectively undermine girls' ability to perform optimally in academic assessments (Levison et al., 2001). These challenges tend to intensify at the secondary school level, where academic expectations increase and foundational learning gaps become more consequential (Richardson et al., 2012).

Synthesis of Literature and Research Gaps

A synthesis of the reviewed literature reveals several key insights. First, household workload is a significant determinant of girls' academic performance, operating through multiple interrelated dimensions (Ferrant et al., 2014). Second, time spent on household chores, physical and mental fatigue, and the gendered distribution of domestic responsibilities represent distinct yet interconnected aspects of girls' lived educational experiences (Bredtmann et al., 2018). Third, existing evidence suggests that home-based gender inequalities systematically disadvantage girls' academic outcomes (Kabeer, 2016).

Despite these insights, important gaps remain. Empirically, few studies simultaneously examine multiple dimensions of household workload within a single analytical framework. Methodologically, limited attention has been given to isolating the independent effects of time, fatigue, and gendered responsibility on academic performance (Gershuny & Sullivan, 2019). Contextually, there is a notable scarcity of studies focusing on urban and post-conflict settings, particularly within Somali secondary education contexts (Justino et al., 2014). These gaps constrain the development of targeted, evidence-based interventions aimed at reducing home-based barriers to girls' academic success.

In response to these limitations, the present study investigates the impact of household workload on girls' academic performance in secondary schools in the Benadir Region. By disaggregating household workload into time spent on household chores, physical and mental fatigue, and the gendered distribution of household responsibilities, the study seeks to generate nuanced, context-specific evidence to inform educational policy, school-level interventions, and household awareness strategies aimed at improving girls' academic outcomes.

Methodology

The study adopted a quantitative research approach to examine the impact of household workload on girls' academic performance in secondary schools, with a specific focus on time spent on household chores, physical and mental fatigue resulting from household work, and the gendered distribution of household responsibilities. A descriptive survey research design was employed to capture female students' experiences of household workload and its relationship with their academic performance. This design was considered appropriate as it allows for the systematic collection of data on existing conditions and facilitates the examination of relationships among study variables within a natural educational setting (Creswell & Creswell, 2018; Bryman, 2016).

The study population comprised female secondary school students enrolled in selected secondary schools in the Benadir Region. These students were considered appropriate respondents because they directly experience household responsibilities alongside academic demands and are therefore well positioned to provide reliable information on the effects of household workload on their academic performance (Levison et al., 2001; Gurmu & Etana, 2014). A simple random sampling technique was used to ensure that all eligible female students had an equal chance of being selected, thereby enhancing the representativeness and generalizability of the findings (Etikan & Bala, 2017). A total sample size of 255 respondents (N = 255) was selected for the study, which is considered adequate for quantitative analysis examining relationships among multiple variables (Hair et al., 2019).

Data collection was conducted over a specified academic period, after which the responses were screened, validated, and prepared for analysis. Data were collected using a structured, researcher-developed questionnaire consisting of two main sections. Section A gathered demographic information of the respondents, including age, grade level, type of school, and living arrangement. Section B contained items measuring the core study variables: time spent on household chores, physical and mental fatigue resulting from household work, gendered distribution of household responsibilities, and girls' academic performance. The use of structured questionnaires is widely recommended in educational and social research for capturing standardized responses and facilitating statistical analysis (DeVellis, 2017).

All items in Section B were measured using a five-point Likert scale ranging from strongly disagree (1) to strongly agree (5). The questionnaire items were developed based on relevant literature and aligned with the study's conceptual framework to ensure content validity and adequate coverage of the study

constructs (Boateng et al., 2018). Prior to the main data collection, the instrument was reviewed to ensure clarity, appropriateness of language, and relevance to the study context, consistent with best practices in survey instrument development (DeVellis, 2017). Given that all data were collected using self-reported measures at a single point in time, potential common method bias was considered. Procedural remedies such as assuring anonymity and reducing evaluation apprehension were applied during data collection. Ethical approval was obtained from an independent institutional ethics committee (Study approved by [redacted]). Informed consent was obtained from parents/guardians, and assent was obtained from student participants prior to data collection.

Statistical Technique

Data analysis was conducted using IBM SPSS software. IBM SPSS was used to analyze demographic data and generate descriptive statistics, including frequencies, percentages, means, and standard deviations, as commonly applied in educational research (Pallant, 2020). Inferential statistical techniques were employed to examine the relationships between the independent variables and the dependent variable. Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS software. PLS-SEM was used to examine the relationships between time spent on household chores, physical and mental fatigue, gendered distribution of household responsibilities, and girls' academic performance. This technique was selected due to its suitability for analyzing complex models with multiple constructs and its ability to handle non-normal data and moderate sample sizes (Hair et al., 2019).

Reliability analysis was performed using Cronbach's alpha to assess the internal consistency of the measurement scales. Cronbach's alpha values of 0.70 and above are generally considered acceptable for research purposes (Tavakol & Dennick, 2011). Statistical significance was determined at the 0.05 level, which is widely accepted as a standard threshold in social science research (Field, 2018).

Results

Demographic Characteristics of Respondents

The demographic characteristics of the respondents were analyzed to provide background information on the study sample. The analysis included variables such as age, grade level, type of school, and living arrangement. The study involved a total of 255 female secondary school students drawn from selected secondary schools in the Benadir Region. A detailed presentation of respondents' demographic characteristics is provided in the corresponding table in the results section.

Table 1
Respondent's Profile (N = 255).

Demographic Items	Frequency (f)	Percentage (%)
Age		
13–15 years	97	38
16–18 years	63	24.7
19 and above	95	37.3
Class Size		
Form1	84	32.9
Form2	31	12.2
Form3	57	22.4
Form4	83	32.5
Type of School		
Public	108	42.4
Private	147	57.6
Living Arrangement		
With parents	86	33.7
With relatives	158	62.0
Other	11	4.3

Table 1 summarizes the demographic characteristics of the respondents. The age distribution shows that 38.0% of the respondents were aged 13–15 years, 24.7% were 16–18 years, and 37.3% were 19 years and above, indicating a balanced representation across age groups.

Regarding class level, Form 1 (32.9%) and Form 4 (32.5%) constituted the largest proportions of the sample, while Form 2 (12.2%) and Form 3 (22.4%) were also represented.

In terms of school type, 57.6% of the respondents attended private schools, whereas 42.4% were from public schools.

Concerning living arrangements, the majority of the respondents (62.0%) lived with relatives, followed by 33.7% living with parents, while 4.3% reported other arrangements.

Overall, the sample reflects adequate demographic diversity to support the study objectives.

Figure 2 presents the measurement model illustrating the relationships between the latent constructs and their observed indicators. The constructs—Time Spent on Household Chores (TSHC), Physical and Mental Fatigue from Household Work (PMHW), Gendered Distribution of Household Responsibilities (GDHR), and Academic Performance (AC)—are each measured using multiple indicators with standardized factor loadings.

All indicator loadings exceed the recommended threshold of 0.70, ranging from 0.781 to 0.893, indicating strong item reliability and adequate convergent validity. This suggests that the observed variables sufficiently represent their respective latent constructs.

The structural paths indicate that GDHR shows the strongest relationship with academic performance ($\beta = 0.533$), followed by TSHC ($\beta = 0.315$), while PMHW shows a weaker relationship ($\beta = 0.063$). The coefficient of determination for academic performance ($R^2 = 0.720$) indicates that the independent variables jointly explain 72.0% of the variance in girls' academic performance, demonstrating substantial explanatory power of the model.

These results indicate that the measurement model satisfies established statistical criteria and supports the adequacy of the model for structural analysis.

Table 2
Measurement Model

Time Spent on Household Chores	Items	Loadings	Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	(AVE)
	TSHC1	**0.663**	**0.917**	**0.917**	**0.937**	**0.750**
	TSHC2	**0.699**				
	TSHC3	**0.660**				
	TSHC4	**0.668**				
	TSHC5	**0.680**				
Physical and Mental Fatigue from Household Work	PMHW1	0.454	0.895	0.897	0.923	0.706
	PMHW2	0.444				
	PMHW3	0.487				
	PMHW4	0.481				
	PMHW5	0.446				
Gendered Distribution of Household Responsibilities	GDHR1	0.670	0.913	0.914	0.935	0.742
	GDHR2	0.760				
	GDHR3	0.734				
	GDHR4	0.703				
	GDHR5	0.680				
Academic Performance	AC1	0.807	0.902	0.903	0.928	0.719
	AC2	0.874				
	AC3	0.843				
	AC4	0.855				
	AC5	0.860				

Table 2 presents the results of the measurement model assessing the reliability and convergent validity of the study constructs. The factor loadings for Time Spent on Household Chores (TSHC), Gendered Distribution of Household Responsibilities (GDHR), and Academic Performance (AC) are generally acceptable, indicating that the items adequately represent their respective constructs. Although the indicator loadings for Physical and Mental Fatigue from Household Work (PMHW) are relatively lower, the construct still demonstrates satisfactory reliability and validity based on composite measures.

The internal consistency reliability of all constructs is confirmed, with Cronbach's alpha values ranging from 0.895 to 0.917, exceeding the recommended threshold of 0.70. Similarly, composite reliability values (rho_a and rho_c) for all constructs are above 0.90, indicating strong construct reliability.

Convergent validity is also established, as the Average Variance Extracted (AVE) values for all constructs exceed the minimum recommended value of 0.50, ranging from 0.706 to 0.750. This indicates that a substantial proportion of variance in the indicators is explained by their respective latent constructs.

Overall, the results demonstrate that the measurement model satisfies the required criteria for reliability and convergent validity, confirming its suitability for subsequent structural model analysis.

Table 3
Discriminant Validity

AC	**AC**	**GDHR**	**PMHW**	**TSHC**
	0.848			
GDHR	0.826	0.861		
PMHW	0.551	0.605	0.840	
TSHC	0.779	0.808	0.527	0.866

Table 3 presents the discriminant validity results of the study constructs using the Fornell–Larcker criterion. The square roots of the Average Variance Extracted (AVE), shown along the diagonal, are higher than the corresponding inter-construct correlations in each row and column. This indicates that each construct shares more variance with its own indicators than with other constructs.

Specifically, Academic Performance (0.848), Gendered Distribution of Household Responsibilities (0.861), Physical and Mental Fatigue from Household Work (0.840), and Time Spent on Household Chores (0.866) demonstrate adequate discriminant validity. Overall, the results confirm that the constructs are empirically distinct and that the measurement model satisfies the discriminant validity requirement.

Table 4
Cross loadings.

AC1	AC	GDHR	PMHW	TSHC
	0.807	**0.725**	**0.427**	**0.673**
AC2	0.874	0.708	0.472	0.672
AC3	0.843	0.656	0.425	0.634
AC4	0.855	0.698	0.481	0.640
AC5	0.860	0.708	0.529	0.680
GDHR1	0.670	0.850	0.477	0.646
GDHR2	0.760	0.881	0.528	0.760
GDHR3	0.734	0.829	0.499	0.708
GDHR4	0.703	0.893	0.553	0.701
GDHR5	0.680	0.852	0.549	0.655
PMHW1	0.454	0.504	0.781	0.415
PMHW2	0.444	0.507	0.853	0.411
PMHW3	0.487	0.501	0.865	0.463
PMHW4	0.481	0.555	0.860	0.507
PMHW5	0.446	0.474	0.838	0.410
TSHC1	0.663	0.710	0.445	0.852
TSHC2	0.699	0.696	0.487	0.881
TSHC3	0.660	0.659	0.438	0.860
TSHC4	0.668	0.679	0.438	0.863
TSHC5	0.680	0.754	0.471	0.873

Table 4 presents the cross-loadings of the measurement items across all constructs to assess discriminant validity. The results show that each indicator loads highest on its intended construct compared to the other constructs. Specifically, items measuring Academic Performance (AC) exhibit their strongest loadings on the AC construct, while Gendered Distribution of Household Responsibilities (GDHR), Physical and Mental Fatigue from Household Work (PMHW), and Time Spent on Household Chores (TSHC) items similarly demonstrate higher loadings on their respective constructs.

Although some items show moderate correlations with other constructs, none of the cross-loadings exceed the primary construct loadings, indicating adequate item discrimination. These findings confirm

that the indicators distinctly measure their intended latent variables and further support the discriminant validity of the measurement model.

Table 5
Heterotrait Monotrait Ratio (HTMT)

AC	AC	GDHR	PMHW	TSHC
GDHR	0.907			
PMHW	0.612	0.669		
TSHC	0.855	0.881	0.580	

Table 5 presents the Heterotrait–Monotrait Ratio (HTMT) values used to assess discriminant validity among the study constructs. Most HTMT values are below the conservative threshold of 0.85 and all are below or very close to the more liberal threshold of 0.90, indicating acceptable discriminant validity between the constructs.

Specifically, the HTMT values between Academic Performance and Physical and Mental Fatigue (0.612), Academic Performance and Time Spent on Household Chores (0.855), and Gendered Distribution of Household Responsibilities and Physical and Mental Fatigue (0.669) fall within acceptable limits. The HTMT value between Academic Performance and Gendered Distribution of Household Responsibilities (0.907) is marginally above the recommended threshold, suggesting a strong conceptual relationship between the two constructs; however, it remains acceptable given theoretical distinctiveness and support from other discriminant validity assessments (Fornell–Larcker criterion and cross-loadings).

Overall, the HTMT results, together with the Fornell–Larcker and cross-loading analyses, confirm that the measurement model demonstrates adequate discriminant validity.

Table 6
Results of path analysis

Hypothesis	Relationship	Beta	Mean (M)	Standard deviation (STDEV)	P values	T values	Decision
H1	**TSHC -> AC**	0.315	0.316	0.093	0.001	3.402	Accepted
H2	**PMHW-> AC**	0.063	0.064	0.048	0.193	1.302	Rejected
H3	**GDHR->AC**	0.533	0.533	0.084	0.000	6.321	Accepted

Table 6 presents the results of the path analysis examining the relationships between household workload dimensions and girls' academic performance. The results indicate that time spent on

household chores (H1) is significantly positively associated with academic performance (β = 0.315, *t* = 3.402, *p* = 0.001), leading to the acceptance of H1.

Similarly, gendered distribution of household responsibilities (H3) shows a strong and statistically significant relationship (β = 0.533, *t* = 6.321, *p* < 0.001), indicating that this variable is the strongest factor associated with girls' academic performance among the household workload dimensions; therefore, H3 is accepted.

In contrast, physical and mental fatigue from household work (H2) does not show a statistically significant relationship with academic performance (*t* = 1.302, *p* = 0.193). Consequently, H2 is rejected.

Overall, the findings suggest that time-related and gender-based household responsibilities are significantly associated with girls' academic performance, while physical and mental fatigue does not show a statistically significant association with academic outcomes in the proposed model.

Table 7
Results of R-square

	R-square
AC	0.720

Table 7 shows the coefficient of determination (R^2) for the dependent variable, Academic Performance (AC). The R-square value of 0.720 indicates that 72.0% of the variance in girls' academic performance is explained by the independent variables—time spent on household chores, physical and mental fatigue from household work, and gendered distribution of household responsibilities. This reflects a substantial explanatory power of the model, suggesting that household workload is a strong factor associated with girls' academic performance. The remaining 28.0% of the variance may be attributed to other factors not included in the model.

Figure 3 presents the structural model with bootstrapped significance values showing the relationships between household workload dimensions and girls' academic performance. The model indicates that time spent on household chores (TSHC) has a statistically significant relationship with academic performance (*p* = 0.001), while gendered distribution of household responsibilities (GDHR) also demonstrates a highly significant relationship with academic performance (*p* = 0.000). These results confirm that time-related and gender-based household responsibilities are significant factors associated with girls' academic performance.

In contrast, physical and mental fatigue from household work (PMHW) does not show a statistically significant relationship with academic performance (*p* = 0.193), indicating that this variable is not significantly associated with academic outcomes within the model.

The model further shows an R^2 value of 0.720 for academic performance, indicating that 72.0% of the variance in girls' academic performance is explained by the combined effects of household workload

dimensions. Overall, the structural model demonstrates strong explanatory power and provides empirical support for the significant relationship between household workload—particularly time demands and gendered responsibilities—and girls' academic performance.

Discussion

This study examined the impact of household workload on girls' academic performance in secondary schools in the Benadir Region, focusing on time spent on household chores, physical and mental fatigue, and the gendered distribution of household responsibilities. The findings provide important empirical insights into how home-based factors shape girls' educational outcomes in an urban and post-conflict context (Justino et al., 2014).

The results indicate that time spent on household chores is significantly associated with girls' academic performance, supporting Hypothesis H1. This finding aligns with Time Allocation Theory, which posits that excessive engagement in non-academic activities reduces the time available for studying and academic preparation (Becker, 1965; Ilahi, 2001). Girls who devote substantial time to household chores are likely to experience reduced study time, irregular homework completion, and limited academic focus, ultimately affecting their academic performance. This result is consistent with prior studies conducted in developing contexts, which report that time-intensive domestic responsibilities interfere with girls' learning outcomes (Levison et al., 2001; Gurmu & Etana, 2014; Bredtmann et al., 2018).

The study further reveals that the gendered distribution of household responsibilities is the strongest factor associated with girls' academic performance, confirming Hypothesis H3. This finding supports Gender Role Theory, which explains how culturally defined gender expectations disproportionately assign domestic labor to girls (Eagly & Wood, 2012). When household responsibilities are distributed based on gender rather than fairness or academic need, girls are systematically placed at an educational disadvantage (Bianchi et al., 2012). This result underscores that household workload is not merely a matter of time or fatigue, but a structural gender issue that directly influences girls' academic success (Kabeer, 2016; Unterhalter & North, 2017).

In contrast, physical and mental fatigue from household work did not show a statistically significant relationship with academic performance, leading to the rejection of Hypothesis H2. While fatigue is commonly associated with domestic labor, this finding suggests that its impact may be indirect or mediated by other factors such as time constraints, coping mechanisms, or school support systems (Basch, 2011; Credé & Kuncel, 2008). It is also possible that girls have adapted to fatigue as a normalized aspect of daily life, thereby reducing its observable direct effect on academic performance in the model (Heissel et al., 2017).

Overall, the high R^2 value (0.720) indicates that household workload dimensions jointly account for a substantial proportion of the variance in girls' academic performance. This highlights the critical role of home-based and gendered factors in shaping educational outcomes and reinforces the need to extend educational interventions beyond the school environment (Ferrant et al., 2014; Gershuny & Sullivan,

2019). This finding not only supports previous studies but also extends existing literature by demonstrating the relative importance of gender-based household responsibilities compared to time and fatigue within a unified analytical framework.

Limitations of the Study

Despite its contributions, this study has several limitations that should be acknowledged. First, the study adopted a cross-sectional survey design, which limits the ability to draw causal conclusions between household workload and academic performance (Bryman, 2016). Second, data were collected using self-reported questionnaires, which may be subject to response bias or social desirability effects (Podsakoff et al., 2003). Third, the study was confined to secondary schools in the Benadir Region, which may limit the generalizability of the findings to other regions or rural contexts (Creswell & Creswell, 2018). Finally, the model focused on direct effects only and did not examine potential mediating or moderating variables, such as parental support or school-level interventions, which could further explain the observed relationships (Hayes, 2018). Therefore, the findings should be interpreted with caution, particularly when generalizing to different geographical, institutional, or cultural contexts beyond the study setting.

Conclusion

The study concludes that household workload is significantly associated with girls' academic performance in secondary schools in the Benadir Region. Specifically, time spent on household chores and the gendered distribution of household responsibilities were found to be significantly associated with academic performance, while physical and mental fatigue did not independently predict academic outcomes. These findings demonstrate that girls' academic challenges are deeply embedded in household practices and gender norms rather than solely in individual or school-related factors (Kabeer, 2016; Unterhalter & North, 2017).

The study highlights the importance of addressing gendered household expectations and reducing excessive domestic responsibilities placed on school-going girls. Educational policymakers, school administrators, and community stakeholders should consider household-level awareness programs, gender-sensitive educational policies, and school-based support mechanisms to promote equitable learning conditions (Ferrant et al., 2014; Bredtmann et al., 2018). By addressing invisible labor within households, meaningful progress can be made toward improving girls' academic performance and advancing gender equity in education.

Recommendations

Policy-Level Recommendations

Education policymakers and relevant government authorities should develop and implement gender-responsive education policies that recognize household workload as a critical barrier to girls' academic performance. Policies should promote community sensitization programs aimed at reducing excessive domestic responsibilities placed on school-going girls, particularly during school days. In addition, collaboration between the education and social welfare sectors is recommended to support vulnerable households through social protection and family support initiatives that reduce reliance on girls' unpaid domestic labor.

School-Level Recommendations

School administrators and teachers should adopt school-based support mechanisms to accommodate girls facing heavy household responsibilities. Such mechanisms may include structured academic support programs, flexible homework schedules, and after-school study sessions to help girls compensate for reduced study time at home. Schools should also strengthen guidance and counseling services to identify students affected by excessive household workload and provide appropriate academic and psychosocial support. Furthermore, schools are encouraged to engage parents through meetings and awareness programs that emphasize the importance of balancing household responsibilities with girls' educational needs.

Parental and Household-Level Recommendations

Parents and guardians should be encouraged to adopt equitable distribution of household responsibilities among children, regardless of gender. Household chores should be shared fairly between boys and girls, with particular consideration given to girls' academic schedules and examination periods. Parents should prioritize girls' education by allocating sufficient time for study, rest, and school-related activities, and by recognizing the long-term benefits of girls' academic success for families and communities.

Recommendations for Future Research

Future studies should employ longitudinal research designs to better examine causal relationships between household workload and academic performance over time. Researchers are also encouraged to explore mediating and moderating variables, such as parental support, school climate, and student motivation, to provide a more comprehensive understanding of the mechanisms through which household workload affects academic outcomes. Additionally, comparative studies across urban and rural settings, as well as qualitative investigations into girls lived experiences of household labor, would further enrich the evidence base and inform context-specific interventions.

Declarations

Funding Declaration

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Data Availability Statement

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Consent to Publish Declaration

Consent to Publish declaration: not applicable.

Competing Interests Declaration

The authors declare that they have no competing interests.

Author Contributions Declaration

L.M.W. contributed to conceptualization, methodology, supervision, and writing—review and editing. A.I.A. contributed to investigation, data collection, and writing—original draft preparation. M.A.O. contributed to methodology, data curation, and formal analysis. A.M.O. contributed to resources, validation, and project administration. A.A.M. contributed to literature review, interpretation of findings, and writing—review and editing. M.O.A.I. contributed to questionnaire development, data collection, and visualization. A.S.E. contributed to data screening, analysis support, and final manuscript revision. All authors reviewed and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

Ethics Approval

Ethical approval for this study was obtained from the Ethics Committee of the Center for Research and Development, SIMAD University, Mogadishu, Somalia. The study was approved under Approval Number EC000194 on 14 February 2026.

Ethical Accordance

The study was conducted in accordance with the ethical standards and guidelines of SIMAD University and complied with the principles of respect for persons, beneficence, and justice.

Consent to Participate

Informed consent was obtained before data collection. Since the study involved secondary school students, parental/legal guardian informed consent was obtained where required, and assent was obtained from student participants before participation. Participants were informed about the purpose of the study, confidentiality and anonymity of their responses, voluntary participation, and their right to withdraw at any time without penalty.

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Figures

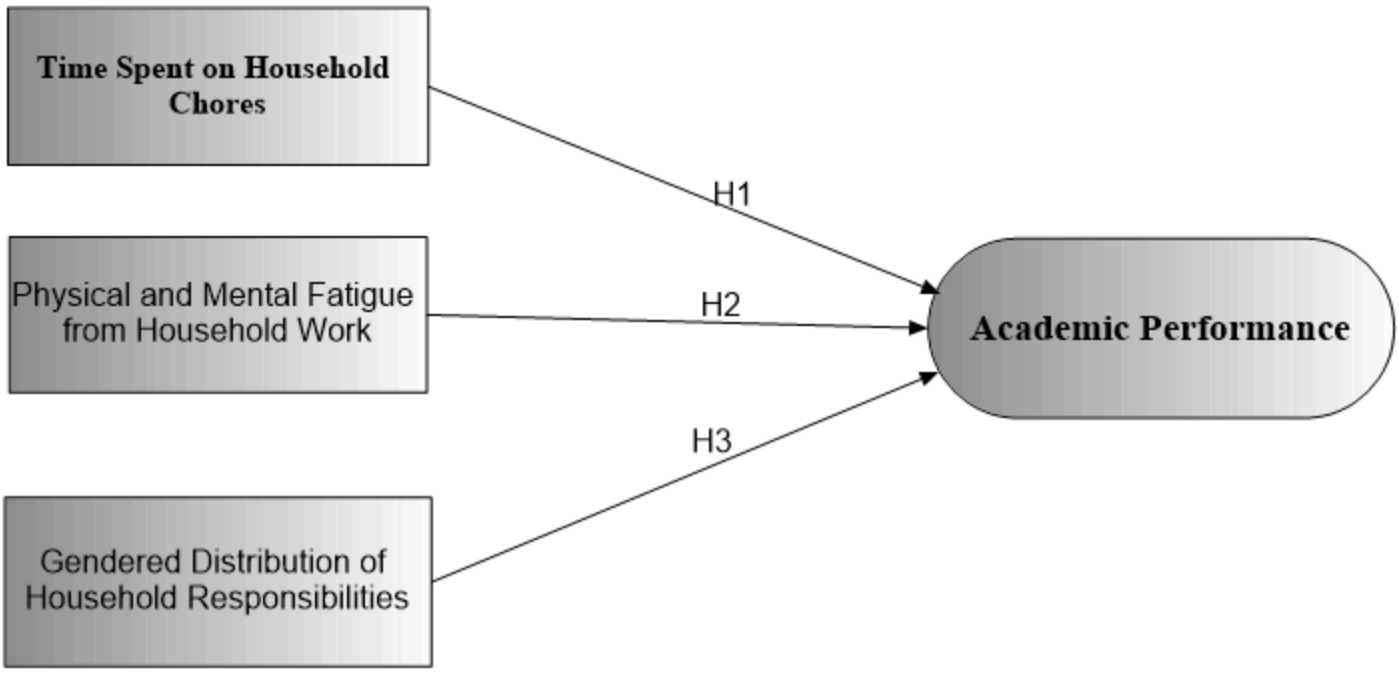


Figure 1

The conceptual relationships among the study variables are illustrated

presents the conceptual framework guiding the study, illustrating the hypothesized relationships between household workload dimensions and girls' academic performance in secondary schools. The framework conceptualizes household workload as a multidimensional construct comprising time spent on household chores, physical and mental fatigue resulting from household work, and the gendered distribution of household responsibilities. These dimensions are proposed as key factors associated with girls' academic performance, in line with the study's research objectives and hypotheses (H1–H3).

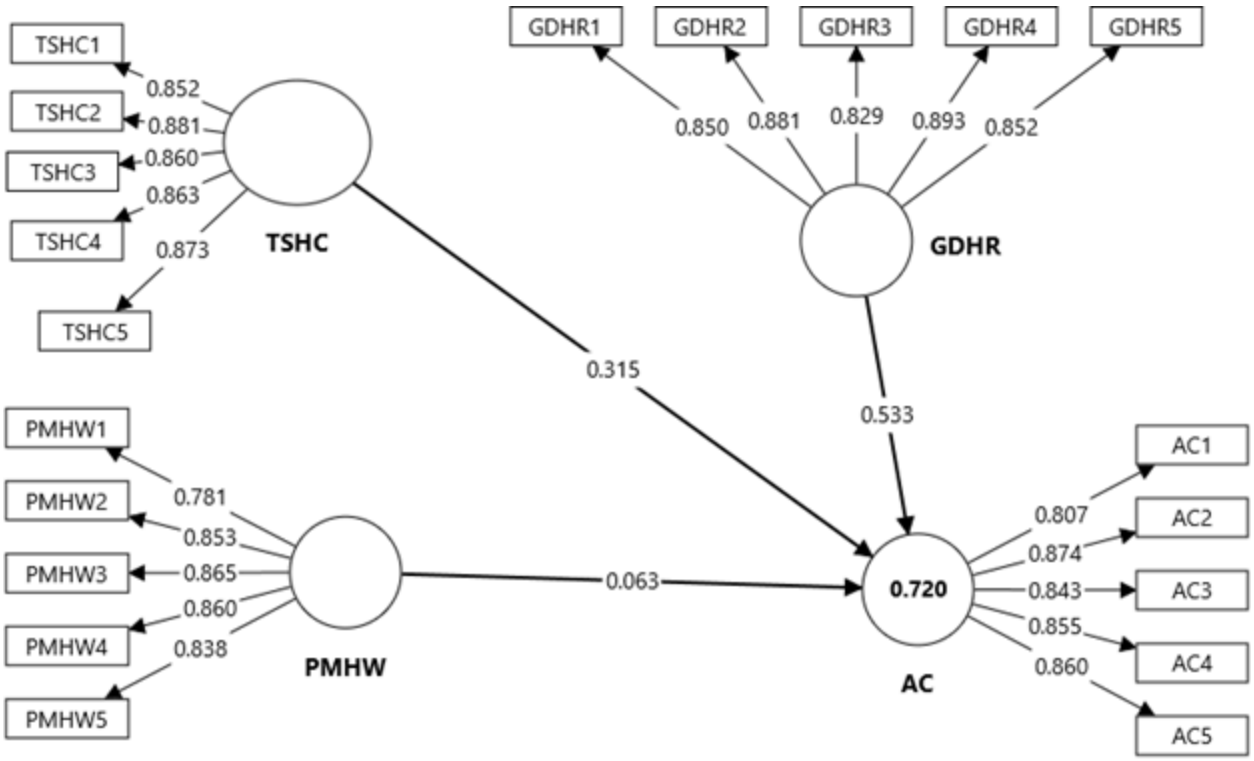


Figure 2

PLS-SEM measurement model with standardized outer loadings for all latent constructs.

presents the measurement model illustrating the relationships between the latent constructs and their observed indicators. The constructs—Time Spent on Household Chores (TSHC), Physical and Mental Fatigue from Household Work (PMHW), Gendered Distribution of Household Responsibilities (GDHR), and Academic Performance (AC)—are each measured using multiple indicators with standardized factor loadings.

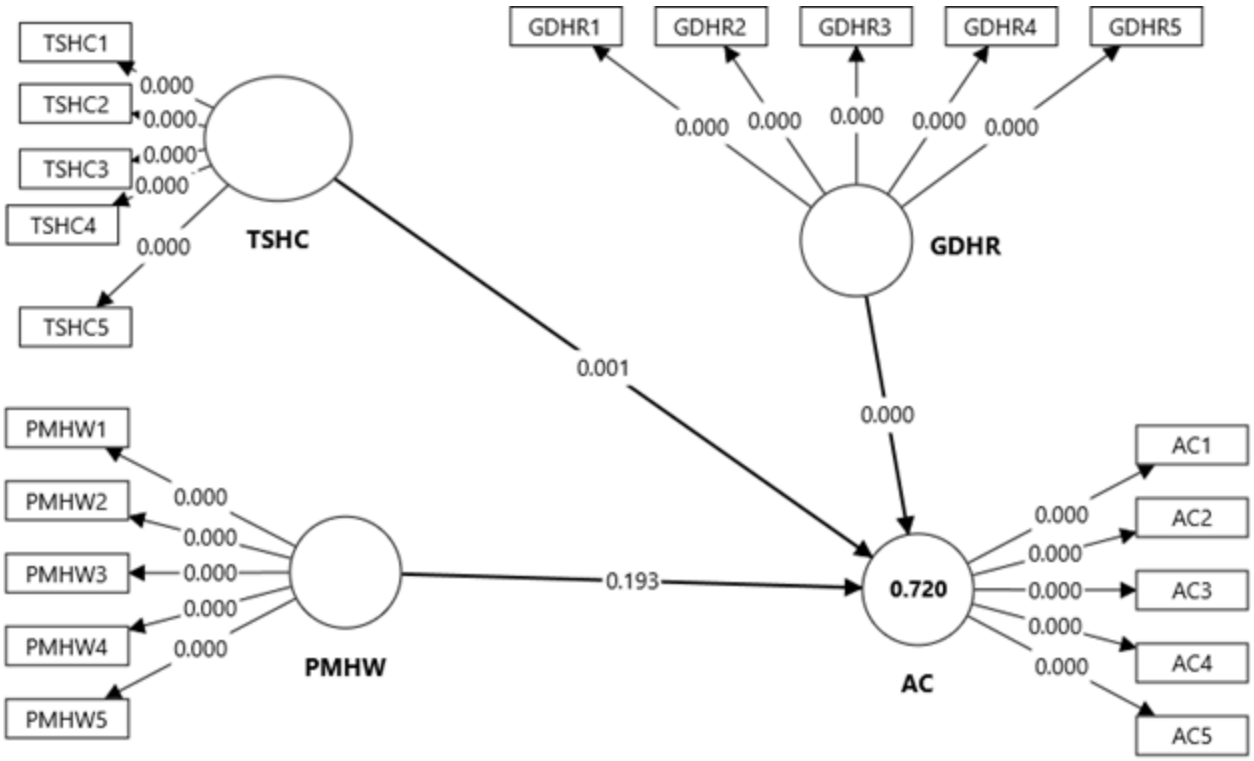


Figure 3

PLS-SEM structural model with path coefficients and explained variance (R^2) for academic performance.

presents the structural model with bootstrapped significance values showing the relationships between household workload dimensions and girls' academic performance. The model indicates that time spent on household chores (TSHC) has a statistically significant relationship with academic performance (p = 0.001), while gendered distribution of household responsibilities (GDHR) also demonstrates a highly significant relationship with academic performance (p = 0.000). These results confirm that time-related and gender-based household responsibilities are significant factors associated with girls' academic performance.