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Gender and Intergenerational transitions in Multidimensional Poverty of households: Evidence from Rural Pakistan

Qurra Tul Ain[1*] | Zahid Pervaiz[2]

Pakistan continues to be facing a persistent problem of poverty that is more often based on gender or age. Household-level [HL] poverty measures generally ignore this hidden poverty. In rural Pakistan, a substantial number of poor women and children are living in non-poor households, underscoring the need for intra-household poverty analysis for elimination of poverty. This study aims to estimate multidimensional poverty within the households along with its transitions in rural Pakistan. Applying Alkire and Foster (AF) (2011) methodology on a balanced panel data (2012- 2014), the study measure poverty among subgroups of men, women and children. The results show that there are significant poverty differences among women, men and children from 2012 to 2014. Women remain the poorest subgroup with poverty levels from 0.36 to 0.3. This is followed by children with poverty index from 0.32 to 0.35 and men from 0.24 to 0.25. Educational deprivation remains particularly higher than other dimensions across all survey rounds. This deprivation is especially prevalent among women, of whom 66% are deprived in education. While children experience increasing health deprivation with 14 percentage points from 2012 to 2013. Regarding poverty severity, women and children are significantly facing more chronic and transitory poverty than men at both national and provincial levels. This study necessitates to formulate long term policies to eradicate poverty. However, these policies should include specialized measures to reach disadvantaged subgroups within households.

Keywords: *Multidimensional Poverty, intra-household poverty, poverty trends, rural Pakistan*

Author's Affiliation:
Institution: University of South Asia, Lahore[1] | National College of Business Administration & Economics, Lahore[2]
Country: Pakistan
Corresponding Author's Email: *qurratulain07@gmail.com

1. INTRODUCTION

Traditional poverty measurement approaches often focus on HL metrics. These approaches are implicitly based on the assumption of equitable distribution of resources within the households. This foundation simplifies the complicated social structure of households, facilitating the easier measurement of poverty for policy formulation. However, it hides the persistent disparities which are generally based on gender and age.

Women and children who live in non-poor households often face unequal access to education, healthcare, and nutrition. (Alderman et al., 1995; Haddad et al., 1997; Quisumbing & Maluccio, 2000; Fafchamps & Quisumbing, 2005; Doss, 2013). These inequalities are generally more evident in South Asian region. In these countries, demands of adult males are particularly prioritized because of cultural customs. (Kabeer, 2005; Duflo, 2012; UN Women, 2015; Klasen & Lahoti, 2021).

Like other South Asian countries, Pakistani women and children also experience higher level of deprivation in comparison to men which is more evident in rural areas (Khan et al., 2015; UN, 2018). Concerning women, the Gender Gap Index 2024 has assigned Pakistan second last position among 148 countries (World Economic Forum, 2024). Moreover, 53 percent of Pakistani women aged 15-64 are deprived of education, while 74 percent of these women are out of formal labor force (UN Women, 2018).

Indicators related to child poverty in Pakistan are also concerning. Nearly 2 in 5 children under five in Pakistan are underdeveloped in terms of stunting due to chronic malnutrition, while nearly 1 in 5 is underweight (Pakistan Demographic and Health Surveys, 2017-2018). Considering the education dimension, 22.8 million of children having age between 5 and 16 are out of school (UNICEF Pakistan, 2021).

These statistics necessitate poverty assessment from gender and age perspectives. Many researchers have addressed the intra-household poverty to identify poverty among disadvantaged groups within households. However, these studies either rely on individual deprivation measurement (Correa, 2017; Espinoza-Delgado & Klasen, 2018; Omotoso & Koch, 2018; Fonta et al., 2020; Klasen & Lahoti, 2021; Tavares & Betti, 2024) or on classification of households on an economic basis (Dunbar et al., 2013; Brown et al., 2021; De Vreyer & Lambert, 2018) In addition, all of these studies are based on cross-sectional data. There is no study on intra-household multidimensional poverty based on demographic subgrouping using panel data.

This study addresses these gaps by using a multidimensional poverty measurement approach to examine poverty by using a demographic subgrouping such as men, women, and children. This form of subgrouping aligns with the structural realities of gendered and generational disadvantage. Moreover, it enables us to assess whether particular demographic groups systematically face more deprivation. Therefore, it is better aligned with the poverty goal of Sustainable Development Goals which emphasizes ‘leaving no one behind’.

Applying the AF (2011) methodology on three year panel data (2012–2014), we also estimate trends in multidimensional poverty for households' subgroups, following Pham et al. (2021) and Ain and Pervaiz (2022). Moreover, we classify subgroups into chronic, transitory, and non-poverty status.

This study has important contributions in the literature on poverty. First, it develops a multidimensional poverty index for demographic subgroups within households. Second, it uses panel data for understanding poverty changes in the poverty of these subgroups that are not possible while using cross-sectional data. Third, it identifies the households' subgroups who suffer from chronic poverty. It offers insights to develop long term policies. Finally, it assists policymakers to formulate polices using poverty measurement tools which consider intra-household inequality.

The rest of this paper consists of five sections. Section 2 contains the literature review on household collective models and poverty measurements. Section 3 consists of methodology, which includes a method for measuring multidimensional poverty, details on selected dimensions and their indicators to be used for poverty measurement, and criteria for categorizing poverty. Section 4 includes the data sources used for the estimations. Section 5 presents the results and discussion. The last section offers a conclusion which also shows policy recommendations.

2. LITERATURE REVIEW

This section critically evaluates the literature related to intra-household poverty which starts from theoretical foundations to empirical evidences.

2.1. Unitary and Collective models

Classical household models assumed equitable distribution of resources among all member of a household (Samuelson, 1956; Becker, 1981). These models considered the household as a single decision making entity. This consideration was based on the attribute of benevolence of household heads towards their members, ignoring the discrimination among disadvantaged members.

To challenge this assumption, several intra-household collective and bargaining models were formulated. In this context, Manser and Brown (1980) and McElroy and Horney (1981), in their bargaining models, differentiated household members on resources allocation which reflected their bargaining power. Moreover, Chiappori (1988, 1992) estimated the individual preferences from HL consumption data while applying Pareto efficiency. These models highlighted different bargaining powers within the household.

To advance these bargaining models, Lundberg et al. (1997) assumed the improvement in children wellbeing when child benefits were given to mothers by UK government. Similarly, Thomas (1990) observed the improvements in health of children in Brazil where household income was controlled by mothers. These models emphasized that members living in a household possess varying preferences, resources, and sharing power. These varying attributes of the members

affect the dynamic influence of resource allocation within households, highlighting intra-household inequalities that conventional approaches overlook.

2.2 Evidences on intra-household poverty

2.2.1. Measurement of poverty by economic classification

Earlier studies measured intra-household poverty while using consumption based data. Dunbar et al. (2013) used semi-parametric preference patterns to measure the households' expenditure division within households in Malawi. The authors discovered a less resource flow towards children in comparison to adults, with each child having up to 25% of resource shares. In contrast, Brown et al. (2021) utilized individual level data on nutrition in Bangladesh and flexible preferences. He discovered the presence of 33% of poor individuals in non-poor households. Both of these studies were based on modeled consumption patterns using collective theory.

Differing from these studies, De Vreyer and Lambert (2018) accumulated data on household consumption for subclasses within households in Senegal. The results reveal the prevalence of intra-household inequality and presence of deprived household members (12.6%) living in affluent households. However, all of these studies were based on consumption-based individual data which is not generally available in all countries.

2.2.2. Gender-based multidimensional poverty

Many studies recognized the poverty as multidimensional phenomena. Considering this, Espinoza-Delgado and Klasen (2018) computed the gender based multidimensional poverty in Nicaragua by considering the incidence, severity, and discrimination. They established that although there is not any major difference in incidence of poverty among males and females, females face more severe poverty in comparison to males. Similarly, Klasen and Lahoti (2021) found gender differential in poverty in case of India. Moreover, Tavares and Betti (2024) discovered that women in Brazil were more disadvantages in terms of resource allocation, job quality and economic security.

2.2.3. Child Poverty

There is also considerable literature on the measurement of child poverty which is generally overlooked by HL poverty measures. Correa (2017) measured child, adult and elderly poverty in some South American countries She discovered that incidence of poverty among children is more common in Chile than in any other examined country. Similarly, Omotoso and Koch (2018) measured the child poverty aged 0-17 in South Africa by using 2-year data on children. The results confirmed the persisting existence of poverty in children who are deprived in living and housing conditions. In addition, Fonta et al. (2020) measured the poverty of adolescent children in West Africa. The author confirmed the deprivation of children in at least four dimensions which are predominantly health, nutrition, water

and toilet facility.

2.2.4. Chronic and transitory poverty

Many studies distinguished poverty into chronic and transitory categories to measure persistence of poverty. In this context, Pham et al. (2021) utilized the panel data for Vietnamese households and found the less chronic poverty (23%) than transitory poverty (31%). in these households. In contrast, Ain and Pervaiz (2022) identified more chronic poor households (37%) than transitory ones (26%) in rural Pakistan.

3. RESEARCH METHODOLOGY

3.1 Measurement of households' subgroups poverty

The present study uses the AF (2011) methodology to measure poverty among demographic subgroups within households. This approach captures deprivations across the dimensions of education, health, and living standard.

The methodology starts with the construction of achievement matrix. Let n represents the number of households' subgroup, and let $d \geq 2$ be the number of indicators used to capture multidimensional deprivation. The achievement matrix Y= y_{ij} contains the outcomes for subgroup i on indicator j. Each indicator is associated with a deprivation cut-off z_j, A subgroup i is recognized as deprived of j if $y_{ij} < z_j$,, resulting in a binary deprivation matrix

$g^0 = g_{ij}^0$, where

$$g_{ij}^0 = \begin{Bmatrix} 1 \; if \; y_{ij} < z_j \\ 0 \; otherwise \end{Bmatrix}$$

Each indicator is then given a weight w_j, such that $\sum_{j=1}^{d} w_j = 1$. These can be equal or unequal, based on the theoretical importance of a particular indicator and are the same for households' subgroups. The deprivation score is then calculated by aggregating all weighted deprivations. It can be represented as follows:

$$c_i = \sum_{j=1}^{d} I\,(y_{ij}^q < z_j)\, w_j \qquad (1)$$

A subgroup is identified as multidimensionally poor if its deprivation score exceeds a chosen poverty threshold k. The identification function is represented as:

$$\rho_k(c_i) = \begin{Bmatrix} 1 \; if \; c_i < \mathrm{k} \\ 0 \; otherwise \end{Bmatrix}$$

The next step is to construct the censored deprivation matrix, which is done by multiplying the deprivation matrix g_{ij}^0 by identification function: $g^k = g_{ij}^0 \times \rho_k(\, y_{ij}\, , z)$. This matrix retains only the deprivations of those identified as poor.

After completing the identification process, the final step is aggregation to obtain the multidimensional poverty index [MPI] which is found by multiplying the headcount ratio (H) with intensity of poverty (A).

Where

$H = s/n$ is the number of poor subgroups (s is the number of poor households' subgroups in the population).

$A = \frac{1}{q}\sum_{i=1}^{q} c_i$, A is the average contribution of all the deprivations experienced by poor.

3.2. Selected Dimensions and Their Indicators

Table 1 lists the selected dimensions along with their indicators. It shows that there is a difference in the thresholds for the men, women, and children subgroups in two dimensions. Each indicator is discussed in detail below:

3.2.1. Education

The AF methodology includes education as its first dimension. For adults, we used the attainment of five years of education by any man or woman aged 10 or older is used as the benchmark, inspired by official report on the MPI in Pakistan, where the educational attainment of at least one man and one woman is necessary to be declared as a non-deprived household in case of years of schooling indicator (Government of Pakistan [GOP], UN Development Programme [UNDP], & Oxford Poverty and Human Development Initiative [OPHI], 2016). In the case of child poverty, all the age groups are covered up to the age of 17, and three deprivation thresholds are assigned to declare the household's children subgroup deprived of education, as done by Hjelm et al. (2016), who created two deprivation thresholds for children in the age group 5-17. However, any child below 5 years old is assumed as deprived in our study if the head of the concerned household has not attained at least five years of education, as done by Espinoza-Delgado and Klasen (2018). For children aged 5-10 years, we used school enrollment for every child in this age range, following Espinoza-Delgado and Klasen (2018). The entrance age in Pakistan for class 1 is 5 years, so the maximum age to complete primary education is 10 (UN Educational, Scientific, and Cultural Organization [UNESCO]-IBE, 2010). However, delayed progression has been corrected using a 1-year buffer, as proposed by Dotter and Klasen (2014) and Klasen and Lahoti (2021). In the case of children aged between 11 and 17, the child group within a household is poor if no child in this age bracket has completed five years of school education.

3.2.2 Health

The standard indicators of health deprivation in the Global MPI are child mortality and nutrition. We cannot use the indicator of child mortality because it belongs only to the married women who gave birth to children. Moreover, the data to measure

nutrition is not available in the survey used in this study. However, deprivation in terms of illness caused by diarrhoea, eruptive disease, injury, or any other disease within the last two weeks is used to measure health deprivation in men, women, and children, as used by Espinoza-Delgado and Klasen (2018).

3.2.3 Living Standard

The study uses seven indicators to assess living standards mentioned in Table 1. The deprivations in these indicators are assumed to apply to all members of the household because data on the indicators of standard of living is only available at the HL in the survey used. Hence, these indicators are considered public goods that are equally available to each household member (Klasen & Lahoti, 2016). This proposition is applicable in most surveys that collect HL data on these indicators. All of these indicators are based on the Pakistan' official report on MPI (GOP, UNDP, & OPHI, 2016). The thresholds for some indicators have been improved to ensure more inclusiveness on the basis of the studies by Alkire and Jahan (2018) and Alkire et al. (2021).

Table 1. Dimensions, indicators, deprivation thresholds, and weights

Dimension	Indicator	Household/men subgroup/women subgroup/children subgroup is deprived if	Weights
Education	**Years of schooling**	(Household) no member (age 10 or above) has completed five years of education (Class 5) (Men) no man (age 18 or above) has completed five years of education (Class 5) (Women) no woman (age 18 or above) has completed five years of education (class 5) (Children) no child has completed threshold years of education[a]	1/3
	illness	(Household) any household member becomes ill[b] within the past two weeks (Men) any man becomes ill within the past two weeks (Women) any woman becomes ill within the past two weeks (Children) any child becomes ill within the past two weeks	1/3
Living standard	**Electricity**	there is no electricity supply.	1/21
	Access to clean water	no access to an improved source of water for drinking, or clean drinking	1/21

for drinking	water that is accessible after more than a 30-minute walk	
Fuel used for cooking	does not use liquid cooking fuels	1/21
Sanitation	no access to an adequate sanitation system	1/21
Assets	does not have more than one small asset[c] AND, has no car or truck.	1/21
Dwellings	unimproved materials have used in the construction of walls or roof or floor[d]	1/21
overcrowding	is overcrowded (4 or more people per room)	1/21

[a] No child (above 12 and less than 18) has completed five years of education (class 5) or Any school-aged child (between 5 and 12)is not attending school or The head of the household (in which a child from age 0 to less than 5 is present) has not completed five years of education
[b] diarrhea, eruptive disease, injury, or several other diseases
[c] (radio, TV, bicycle, refrigerator, telephone/mobile, animal cart, computer, motorcycle
[d] Household is deprived if walls are constructed using mud/ wood/ bamboo/raw bricks or any other material, if the roof is made of wood/ bamboo or any other basic material, or if the floor is made of mud.

3.3. Categorization of Poverty

In addition to measuring poverty, the study also classified households' subgroups into three categories based on a study by Pham et al. (2021). First category is the chronic poor subgroups who remain poor in all rounds. The secondary category is transitory poor ones who are poor in one or two years, but not in all. The last category include those subgroups who are never poor between 2012 and 2014.

3.4 Data Sources

We used three year panel data from the Pakistan Rural Household Survey [PRHS], which was published by International Food Policy Research Institute. This survey was conducted in 2012, 2013, and 2014 for the rural areas of all provinces except Baluchistan. The inconsistencies in household identifications over the three waves led to a balanced panel of 1721 households1. This panel structure allows for an analysis of poverty dynamics, tracking the same households and their subgroups over time, which is crucial for understanding transitions into and out of poverty.

4. EMPIRICAL RESULTS

4.1 Uncensored Headcount Ratio

Before measuring poverty, we estimate the headcount ratios (deprivations) of subgroups in all the indicators under dimensions of education, health, and standard of living in each year, following Alkire et al. (2015). These headcount ratios are presented in Figure. 1 (a), (b), (c), and (d). Overall, the levels of deprivation vary across different subgroups and years. However, the profiles of deprivation exhibit notable similarities.

[1] Although the exclusion of households from the PRHS dataset may create the problem of attrition, many previous studies use this data and reported the randomness of attrition (see, Eskander et al., 2016; Kousar et al., 2021).

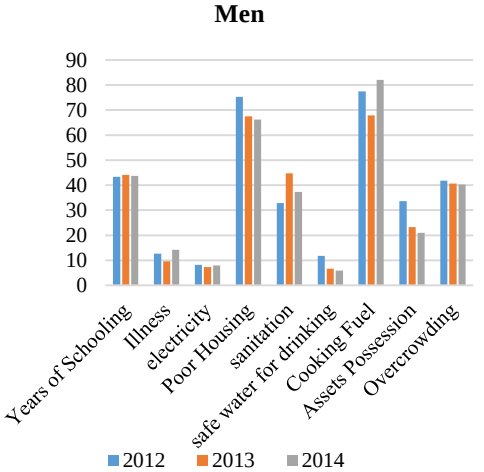
In terms of education, the most striking result is the persistently high deprivation faced by women. Two-thirds of the women are deprived in education from 2012 to 2014. This alarming figure shows negligible or no efforts to combat poverty among women over time, highlighting structural barriers in female education in rural Pakistan. Men and children also experience notable deprivation in education. However, the figures show comparatively lower rates and fairly more variability across the years. Minimal fluctuations in adult (men and women) education levels over the panel period are attributed to many factors such as aging (e.g., individuals transitioning from child to adult categories), in- and out-migration and adult education attainment.

In the health dimension, deprivations are lower than those in education but still notable. There is a significant gender gap (approximately five percentage points), as women experience higher rates of health deprivation than men in all three years. However, children exhibit the highest level of health deprivation. In fact, we witness a sharp increase of 14 percentage points from 2012 to 2013 in children's health deprivation. This indicates serious concerns about policies for child well-being and basic healthcare services access in rural areas of Pakistan.

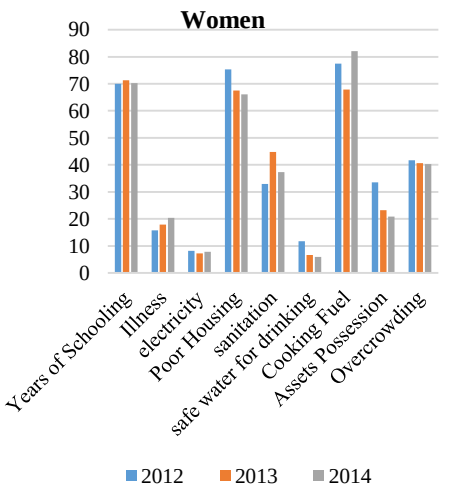
The indicators related to living standards are common to all household members due to shared household-level measurement. Substantial deprivations exist in the quality of housing, sanitation facilities, overcrowding, and use of unsafe cooking fuel from 2012 to 2014. However, there is a marginal improvement in overcrowding. Encouragingly, access to electricity and safe drinking water improve slightly over time, reflecting infrastructure expansion efforts.

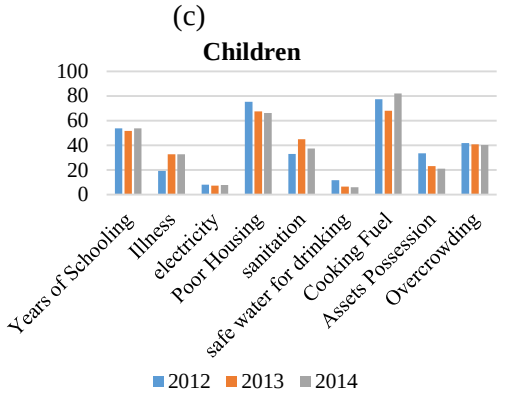
Figure 1(a), (b), (c), and (d). Percentage deprivation of households' subgroups for each indicator

(a)



(b)





Source: Authors' estimates based on a data sample of 5163 households covering 3 rounds i.e. 2012, 2013, and 2014, taken from the official website of IFPRI.

4.2 National Estimates of Subgroup Multidimensional Poverty

The subgroup-specific and HL poverty estimates for each year are presented in Table 2. At HL, the Multidimensional Poverty Index (MPI) shows an increasing trend, rising from 0.29 in 2012 to 0.32 showing a 10% increase by 2014. This increasing trend is also found by Arif and Farooq (2014). The authors estimated an increase in monetary poverty between 2001 and 2010 in Punjab and Sindh using panel data on rural Pakistan. These observed trends of increasing poverty in rural Pakistan pose serious questions about government efforts to alleviate rural poverty.

When comparing poverty across household subgroups using the conventional HL-MPI, children emerge as the most deprived group, followed by women and men. Their poverty increases by 2014 with children having a 20 percent increase, men with 16 percent and women with 11 percent. Moreover, by comparing different subgroups in a comparable household MPI, we find a small gender and intergenerational differential in HL-MPI over three years. However, HL measures of poverty fail to capture intra-household inequalities due to assumptions of equal sharing of resources and expansive nature of indicators used for measurement (Klasen & Lahoti, 2021)

This judgment shifts markedly when using the subgroup-specific methodology proposed in this study. Subgroup analysis reveals that women experience the highest levels of multidimensional poverty which has increased by 4 percent by 2014. These findings are consistent with the findings of existing literature on gender disparities in poverty (e.g., Horenstein, 1989; Klasen & Lahoti, 2021). These studies identify the factors such as limited access to education, health services, and productive resources responsible for women's deprivations. Children rank as the second most deprived subgroup in the intra-household analysis. Their poverty increases by 9 percent from 2012 to 2014. Their high poverty levels highlight intergenerational disparities within households and reinforce findings from other studies on child poverty (e.g., Espinoza-Delgado & Klasen, 2018). In comparison to other subgroups, men consistently experience the lowest MPI which increases by 3% by 2014.

Additionally, the intensity of poverty across all subgroups remains relatively stable. However, variations in the headcount ratio are the primary drivers of observed changes in subgroup MPIs over time. Specifically, higher poverty rates in the women and children subgroups are significantly driven by variability in the poverty headcount ratios in all three waves, rather than intensity of poverty which changes only slightly (see also, Klasen & Lahoti, 2021).

Table 2 also shows the increase in intergenerational gap between men and children significantly over the panel period. This gap increases from 8% in 2012 to 41.15% in 2014. This demonstrates that subgroup of children is more disadvantaged than that of men. Regarding poverty transitions, children's MPI has increased by 0.036 points during this period, while the MPI for men and women remains statistically unchanged. These results confirm that conventional HL poverty measures mask important disparities among household members. This leads to underestimation of the vulnerability of women and children.

Table 2. Estimates of poverty by subgroup, year, and national level along with absolute changes

Measure	Year	Men	Women	Children	Gender gap (men and women)		Intergenerational gap (men and children)		Household
					Absolute	Relative	Absolute	Relative	
HL-MPI	**2012**	0.25	0.27	0.30	0.02***	1.08	0.05***	1.2	0.29
	2013	0.27	0.28	0.34	0.01***	1.04	0.07***	1.26	0.31
	2014	0.29	0.30	0.36	0.01***	1.03	0.07***	1.07	0.32
Absolute $\Delta_{2012\text{-}2014}$		0.04***	0.03***	0.05***					0.03***
Relative $\Delta_{2012\text{-}2014}$		1.16	1.11	1.20					1.10
Subgroup MPI	**2012**	0.24 (0.008)	0.36 (0.008)	0.32 (0.009)	0.11***	1.5	0.08***	1.33	
	2013	0.23 (0.008)	0.36 (0.009)	0.33 (0.010)	0.13***	1.57	0.10***	1.43	
	2014	0.25 (0.005)	0.37 (0.009)	0.35 (0.010)	0.12***	1.48	0.10***	1.4	
Absolute $\Delta_{2012\text{-}2014}$		0.01***	0.01***	0.03***					
Relative $\Delta_{2012\text{-}2014}$		1.04	1.03	1.09					

Subgroup Headcount ratio	**2012**	46.0% (0.0015)	66.1% (0.014)	53.9% (0.015)	-20.1***	1.44	7.9***	1.17
	2013	42.7% (0.008)	65.4% (0.015)	52.8% (0.015)	-22.7***	1.53	10.1***	1.24
	2014	45.8% (0.009)	65.1% (0.015)	56.2% (0.015)	-19.3***	1.42	10.4***	1.23
Subgroup Intensity	**2012**	0.53 (0.005)	0.51 (0.005)	0.58 (0.006)	-0.02**	0.96	0.05***	1.09
	2013	0.54 (0.005)	0.50 (0.005)	0.63 (0.006)	-0.04***	0.93	0.09***	1.67
	2014	0.52 (0.005)	0.51 (0.005)	0.63 (0.007)	-0.01***	0.98	0.09***	1.21

The poverty threshold is 0.4, according to Mitra (2016) and Azeem et al. (2017). Standard errors are mentioned in parentheses with significance levels *** p<0.01, ** p<0.05.

4.3 Robustness Analysis

To ensure the robustness of the observed poverty trends, we conduct sensitivity tests using alternative poverty cut-off thresholds of 0.2 and 0.333, in addition to the main threshold of 0.4. The results of this robustness analysis are reported in Table 3.

Consistent with the main findings, both lower cut-offs confirm that women and children remain significantly more deprived than men throughout the three-year period. The MPI for women exceeds that of men by 12 to 14 percentage points. While the difference between men and children remains between 6 and 11 percentage points, depending on the cut-off. Moreover, poverty in children consistently increases over the three years across all three thresholds. However, men and women show no statistically significant changes in MPI over time.

This robustness check validates the subgroup-specific poverty assessment. It also demonstrates that the observed inequalities are not due to the cut-off threshold alone.

Table 3. Multidimensional Poverty in households' subgroups considering various poverty cut-offs

Measure	**Year**	**Men**	**Women**	**Children**	**Gender gap**		**Intergenerational gap**	
					Absolute	**Relative**	**Absolute**	**Relative**
MPI k=0.2	2012	0.27	0.4	0.34	0.13***	1.48	0.07***	1.26
	2013	0.26	0.40	0.37	0.14***	1.54	0.11***	1.42
	2014	0.28	0.41	0.38	0.13***	1.46	0.10***	1.36
Absolute $\Delta_{2012\text{-}2014}$		0.00	0.01	0.04***				
Relative $\Delta_{2012\text{-}2014}$		1.04	1.02	1.12				

Poverty (MPI) k=0.333	2012	0.26	0.39	0.33	0.13***	1.5	0.07***	1.27
	2013	0.24	0.39	0.35	0.11***	1.63	0.11***	1.46
	2014	0.27	0.40	0.38	0.13***	1.44	0.11***	1.41
Absolute $\Delta_{2012\text{-}2014}$		0.01	0.01	0.07***				
Relative $\Delta_{2012\text{-}2014}$		1.04	1.02	1.15				

Standard errors are mentioned in parentheses with significance levels *** p<0.01, ** p<0.05.

4.4 Multidimensional Poverty at Provincial Levels

We further disaggregate subgroup poverty by province such as Punjab, Sindh, and Khyber Pakhtunkhwa (KP) (Table 4).

Considering the provinces, men consistently report the lowest MPI values in all the provinces. Whereas, women exhibit the highest levels of deprivation. However, among the provinces, the highest poverty in men is observed in Sindh, followed by Punjab and KP in all the years. Moreover, in Sindh, men's MPI rises slightly from 0.34 in 2012 to 0.36 in 2014, while in Punjab, it declines modestly over the same period. Most volatility is found in KP. MPI in men drops from 0.16 to 0.12 between 2012 and 2013, and then has increased to 0.24 in 2014. These trends point to region-specific economic dynamics and possible shocks which have affected men's well-being in KP in 2014.

In Sindh, highest poverty is found among women, where it has significantly increased from 0.46 in 2012 to 0.50 in 2014. This pattern is largely because of low female literacy rate and inadequate access to health services in rural Sindh, also verified by GOP (2015). Whereas, in Punjab and KP, women poverty remains relatively stable during this period, which is likely due to targeted provincial efforts to improve access to education for females (e.g., Magsi et al., 2016).

Among children, Sindh again records the highest MPI, increasing significantly from 0.43 to 0.51 between 2012 and 2014. It can be due to underutilization of education expenditures in Sindh, as a dimension of education is more than 60% responsible for child deprivation (shown in Fig. 1). Punjab has unchanged poverty estimates in case of children. While in KP, there is a significant increase of over 10 percentage points. This rise may be due to increasing dropout ratios in rural schools, as inferred from ASER (2015) data.

Table 4. Estimates of poverty for households' subgroups at provincial levels for 2012-2014

Measure	Year	Punjab	Sindh	KP
Men MPI	2012	0.22	0.34	0.16
[MMPI]		(0.01)	(0.02)	(0.02)
	2013	0.20	0.35	0.12
		(0.01)	(0.02)	(0.02)
	2014	0.21	0.36	0.24
		(0.01)	(0.02)	(0.02)

Absolute $\Delta MMPI_{2012-2014}$		-0.01	0.02	0.08**
Relative $\Delta MMPI_{2012-2014}$		0.95	1.06	1.5
Women MPI [WMPI]	2012	0.34	0.46	0.32
		(0.01)	(0.02)	(0.02)
	2013	0.32	0.50	0.31
		(0.01)	(0.02)	(0.02)
	2014	0.33	0.50	0.32
		(0.01)	(0.02)	(0.02)
Absolute $\Delta WMPI_{2012-2014}$		-0.01	0.04*	0.00
Relative $\Delta WMPI_{2012-2014}$		0.97	1.09	
Children MPI [CMPI]	2012	0.29	0.43	0.22
		(0.01)	(0.02)	(0.02)
	2013	0.30	0.46	0.28
		(0.01)	(0.02)	(0.03)
	2014	0.30	0.51	0.33
		(0.01)	(0.02)	(0.03)
Absolute $\Delta CMPI_{2012-2014}$		0.01	0.08***	0.11***
Realtive $\Delta CMPI_{2012-2014}$		1.03	1.00	1.5

Standard errors are mentioned in parentheses with significance levels *** p<0.01, ** p<0.05.

4.5 Poverty Estimates by Categories

To explore poverty dynamics over time, we classify subgroups into three categories: chronically poor, transitorily poor, and never poor which are shown in Table 5. It presents the poverty estimates nationally as well as provincially.

Talking about subgroups individually, women remain the most chronically poor subgroup at national level. Nearly 55 percent of women are declared as chronically poor. This trend is followed by children with 42 percent of them chronically poor. While, men experience the lowest chronic poverty rates with 35 percent. These findings confirm that more women and children face high as well as persistent poverty than men.

We can see the similar pattern at provincial levels. Women remain the most chronically poor subgroup in all the provinces. However, among provinces, Sindh has 83.9 percent of chronically poor women, which shows systemic gender inequality. Transitory poor women are relatively less in number. This pattern reflects long-term existence of deprivation among women. It also indicates the limited effectiveness of existing social programs for poverty reduction among them.

Table 5. Changes in Multidimensional Poverty at national and provincial levels (in percentage)

Level	Category	Country	Punjab	Sindh	KP
Men	**Chronic**	34.81	30.14	58.64	10.94

	Transitory	22.93	22.94	16.79	35.94
	Never	42.26	46.92	24.57	53.13
Women	**Chronic**	54.77	47.88	83.94	32.11
	Transitory	23.92	27.85	8.76	33.68
	Never	21.30	24.27	7.30	34.21
Child	**Chronic**	42.24	36.06	67.96	22.92
	Transitory	28.12	30.18	20.15	33.33
	Never	29.63	33.76	11.89	43.75

Talking about children, they also experience significant chronic poverty in all the provinces. However, Sindh has the highest position with 68 percent of chronically poor children followed by Punjab with 36 percent and KP with 22 percent. These figures highlight the limited interaction between provincial education policies and child specific services. In contrast, men exhibit more stability in terms of chronic poverty in all provinces. In Punjab and KP, nearly half of the men are in non-poor category. Whereas, non-poor men in Sindh are approximately 25 percent. Nevertheless, these findings reveal better resilient opportunities for men.

These findings confirm that poverty is predominant as well as chronic among these subgroups. Based on these, we can assess the structural problems which may specifically affect women and children in rural Pakistan.

5. CONCLUSION

This study contributes to existing literature on poverty by measuring multidimensional poverty using a demographic classification. It measures poverty for households' subgroups of men, women and children along with its changes by using a panel data. It also estimates the poverty and poverty changes of these subgroups across provinces to identify the regional aspects of poverty.

Our findings show that women and children experience higher multidimensional poverty than men. This higher poverty is both in terms of headcount and intensity. Talking about dimensional deprivations, educational deprivation is the most prevalent, particularly among these vulnerable subgroups. It highlights the participation of gendered and generational educational deprivation in increasing poverty. Furthermore, the increasing health deprivation particularly among children, shows problems in the access of age-targeted health facilities in rural areas. These findings imply that there should be formulation of those policies which should reach women and children. Particularly, these policies must take into account the provision of educational and health facilities to these disadvantaged subgroups.

The intra-household poverty estimates at the provincial levels show that poverty among men has increased in KP. In the other two provinces, it is quite stable. In contrast, poverty among women has only increased in Sindh from 2012 to 2014. In case of children, both KP and Sindh experience an increase in poverty by 2014.

These regional-specific findings suggest that policies aimed at reducing poverty must be customized according to both demographic and regional aspects. For instance, Sindh particularly requires massive investment in education and health related services and cash transfer schemes towards women and children. These disadvantaged subgroups are likely to be overlooked by existing poverty-reduction programs.

This study also demonstrates that poverty is prevalent as well as persistent, particularly among women and children. Across all three survey waves, a significant share of women (55%) and children (42%) were identified as chronically poor, compared to 35% of males. These structural patterns in poverty emphasize the need for continuous efforts rather than one-time interventions. The regional analysis on the persistence of poverty among these groups also assist in targeting polices towards highly affected areas due to poverty.

This study provides an empirical evidence to understand existence of intra-household poverty, however, it has also some limitations. The lack of data on individual-level nutrition and living standards may result in an overestimation of some differences. There is a need for surveys which may collect detailed data on indicators related to health and living standard which will assist deep-rooted investigation of intra-household poverty.

Data Availability

The panel data for 2012, 2013 and 2014 used in this study is publically available at https://doi.org/10.7910/DVN/28558, https://doi.org/10.7910/DVN/LT631P and https://doi.org/10.7910/DVN/JWMCXY..

Declaration of Interest Statement

The authors have not declared any conflicts of interest. Moreover, the authors received no funding from any organization for the article they submitted.

REFERENCES

Ain, Q. T., & Pervaiz, Z. (2022). An analysis of multidimensional poverty in rural pakistan over time. Competitive Education Research Journal, 3(1), 30–42. http://cerjournal.com/index.php/cerjournal/article/view/21

Alderman, H., Behrman, J. R., & Hoddinott, J. (2007). Economic and nutritional analyses offer substantial synergies for understanding human nutrition. The Journal of nutrition, 137(3), 537-544. https://doi.org/10.1093/jn/137.3.537

Alderman, H., Chiappori, P. A., Haddad, L., Hoddinott, J., & Kanbur, R. (1995). Unitary versus collective models of the household: is it time to shift the burden of proof? The World Bank Research Observer, 10(1), 1-19. https://doi.org/10.1093/wbro/10.1.1

Alkire, S., & Foster, J. (2011). Counting and multidimensional poverty measurement. Journal of public economics, 95(7-8), 476-487. https://doi.org/10.1016/j.jpubeco.2010.11.006

Alkire, S., & Jahan, S. (2018). The New Global MPI 2018: Aligning with the Sustainable Development Goals (No. 121). Queen Elizabeth House, University of Oxford.

Alkire, S., & Santos, M. E. (2014). Measuring acute poverty in the developing world: Robustness and scope of the multidimensional poverty index. World Development, 59, 251-274. https://doi.org/10.1016/j.worlddev.2014.01.026

Alkire, S., Kanagaratnam, U., & Suppa, N. (2021). The global multidimensional poverty index (MPI). The Oxford Poverty and Human Development Initiative (OPHI), Oxford Department of International Development, University of Oxford, Oxford.

Alkire, S., Roche, J. M., Ballon, P., Foster, J., Santos, M. E., & Seth, S. (2015). Multidimensional poverty measurement and analysis. Oxford University Press, USA.

Arif, G. M., & Farooq, S. (2014). Rural Poverty Dynamics in Pakistan: Evidence from Three Waves of the Panel Survey. The Pakistan Development Review, 53(2), 71-98.

ASER (2015). Annual status of education report. South Asian Forum for Education Development, Idara-e-Taleem-Aagahi, Lahore. December 17, 2015.

Azeem, M. M., Mugera, A. W., Schilizzi, S., & Siddique, K. H. (2017). An Assessment of Vulnerability to Poverty in Punjab, Pakistan: Subjective Choices of Poverty Indicators. Social Indicators Research, 134(1), 117-152.

Becker, G. S. (1981). A treatise on the family. Harvard University Press.

Brown, C., Calvi, R., & Penglase, J. (2021). Sharing the pie: An analysis of undernutrition and individual consumption in Bangladesh. Journal of Public Economics, 200, 104460.

Chiappori, P. A. (1988). Rational household labor supply. Econometrica: Journal of the Econometric Society, 63-90. https://doi.org/10.2307/1911842

Chiappori, P. A. (1992). Collective labor supply and welfare. Journal of political Economy, 100(3), 437-467.

De Vreyer, P., & Lambert, S. (2018). By Ignoring Intra-Household Inequality Do We Underestimate the Extent of Poverty? Working Paper 2018-12. Paris, France: Paris School of Economics.

Doss, C. (2013). Intrahousehold bargaining and resource allocation in developing countries. The World Bank Research Observer, 28(1), 52-78. https://doi.org/10.1093/wbro/lkt001

Dotter, C., & Klasen, S. (2014). The concept of relative multidimensional poverty: An illustration using Indian DHS data. In 33rd Annual Conference of the IARIW, Rotterdam.

Duflo, E. (2012). Women empowerment and economic development. Journal of Economic literature, 50(4), 1051-1079. DOI: 10.1257/jel.50.4.1051

Dunbar, G. R., Lewbel, A., & Pendakur, K. (2013). Children's resources in collective households: identification, estimation, and an application to child poverty in Malawi. American Economic Review, 103(1), 438-471. https://doi.org/10.1257/aer.103.1.438

Eskander, S., Fankhauser, S. R., & Jha, S. (2016). Do Natural Disasters change Savings and Employment Choices? Evidence from Bangladesh and Pakistan. Economic Working Paper Series No. 505. Asian Development Bank.

Espinoza-Delgado, J., & Klasen, S. (2018). Gender and multidimensional poverty in Nicaragua: An individual based approach. World Development, 110, 466-491.

Fafchamps, M., & Quisumbing, A. R. (2005). Marriage, bequest, and assortative matching in rural Ethiopia. Economic Development and Cultural Change, 53(2), 347-380.

Fonta, C. L., Yameogo, T. B., Tinto, H., Van Huysen, T., Natama, H. M., Compaore, A., & Fonta, W. M. (2020). Decomposing multidimensional child poverty and its drivers in the Mouhoun region of Burkina Faso, West Africa. BMC public health, 20, 1-17. https://doi.org/10.1186/s12889-020-8254-3

Correa, A.F. (2017). On The Measurement of Multidimensional Poverty as a Policy Tool. Empirical Applications to Chile, Colombia, Ecuador and Peru. Doctoral Dissertation, Maastricht University, Netherland.

Government of Pakistan, United Nations Development Programme, & Oxford Poverty and Human Development Initiative. (2016). Multidimensional poverty in Pakistan. Ministry of Planning and Development.

Government of Pakistan, Ministry of Finance, Economic Advisor's Wing. (2015). Economic survey of Pakistan 2014-15. Ministry of Finance.

Haddad, L., & Kanbur, R. (1990). How serious is the neglect of intra-household inequality? The Economic Journal, 100(402), 866-881. https://doi.org/10.2307/2233663

Haddad, L., Hoddinott, J., & Alderman, H. (1997). Intrahousehold resource allocation in developing countries: Models, methods, and policy. Johns Hopkins University Press.

Hjelm, L., Ferrone, L., Handa, S., & Chzhen, Y. (2016). Comparing approaches to the measurement of multidimensional child poverty. Innocenti Working Paper WP-2016-29. UNICEF Office of Research. https://hdl.handle.net/20.500.12799/5240

Horenstein, N. R. (1989). Women and food security in Kenya (Vol. 232). World Bank Publications. https://doi.org/10.1002/pop4.99

Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. Development and Change, 30(3), 435-464. https://doi.org/10.1111/1467-7660.00125

Kabeer, N. (2005). Gender equality and women's empowerment: A critical analysis of the third millennium development goal 1. Gender & Development, 13(1), 13-24. https://doi.org/10.1080/13552070512331332273

Khan, A. U., Saboor, A., Hussain, A., Karim, S., & Hussain, S. (2015). Spatial and temporal investigation of multidimensional poverty in rural Pakistan. Poverty & Public Policy, 7(2), 158-175.

Klasen, S., & Lahoti, R. (2016). How serious is the neglect of intra-household inequality in multidimensional poverty indices? SSRN Electronic Journal. https://dx.doi.org/10.2139/ssrn.2742083

Klasen, S., & Lahoti, R. (2021). How serious is the neglect of intra-household inequality in multidimensional poverty and inequality analyses? Evidence from India. Review of Income and Wealth, 67(3), 705-731. https://doi.org/10.1111/roiw.12491

Kouser, S., Abedullah, A., & Spielman, D. J. (2021). Impact of Rural Women Time Allocation to Agricultural Production on Household Food Security in Pakistan. Research in Agriculture and Applied Economics.

Lundberg, S. J., Pollak, R. A., & Wales, T. J. (1997). Do husbands and wives pool their resources? Evidence from the United Kingdom child benefit. Journal of Human Resources, 32(3), 463-480. https://doi.org/10.2307/146179

Magsi, I., Sahito, I. H., & Magsi, H. (2016). Socioeconomic conditions of women in Southern Punjab with special reference to Kamber-Shahdadkot District. Commerce and Economics Review, 2(2), 17-25.

Manser, M., & Brown, M. (1980). Marriage and household decision-making: A bargaining analysis. International Economic Review, 21(1), 31-44. https://doi.org/10.2307/2526238

McElroy, M. B., & Horney, M. J. (1981). Nash-bargained household decisions: Toward a generalization of the theory of demand. International Economic Review, 22(2), 333-349.

Mitra, S. (2016). Synergies among monetary, multidimensional and subjective poverty: Evidence from Nepal. Social Indicators Research, 125, 103-125.

National Institute of Population Studies (NIPS) Pakistan, & ICF. (2019). Pakistan demographic and health survey 2017-18. NIPS/Pakistan and ICF. https://dhsprogram.com/pubs/pdf/FR354/FR354.pdf

Omotoso, K. O., & Koch, S. F. (2018). Exploring child poverty and inequality in post-apartheid South Africa: a multidimensional perspective. Journal of Poverty and Social Justice, 26(3), 417-437. https://doi.org/10.1332/175982718X15361435470229

Pham, A. T. Q., Mukhopadhaya, P., & Vu, H. (2021). Estimating poverty and vulnerability to monetary and non-monetary poverty: The case of Vietnam. Empirical Economics, 61(6), 3125-3177.

https://doi.org/10.1007/s00181-020-01991-4

Quisumbing, A. R., & Maluccio, J. A. (2000). Intrahousehold allocation and gender relations: New empirical evidence from four developing countries. International Food Policy Research Institute.

Samuelson, P. A. (1956). Social indifference curves. The Quarterly Journal of Economics, 70(1), 1-22. https://doi.org/10.2307/1884510

Sen, A. (1984). Family and food: Sex bias in poverty. In A. Sen (Ed.), Resources, values and development (pp. 346-365). Harvard University Press.

Tavares, F. F., & Betti, G. (2024). Gender differences in multidimensional poverty in Brazil: A fuzzy approach. Social Indicators Research, 175,385-422. https://doi.org/10.1007/s11205-024-03312-z

Thomas, D. (1990). Intra-household resource allocation: An inferential approach. The Journal of Human Resources, 25(4), 635-664. https://doi.org/10.2307/145670

UN Women (2015). UN Women Annual Report 2015-2016. New York, USA: UN Women.

UN Women (2018). UN Women annual report 2017-2018. UN Women, New York, USA.

UNESCO-IBE (2010). World Data on Education. 7th Edition, UNESCO, Paris.

UNICEF Pakistan. (2021). Education: Out-of-school children. https://www.unicef.org/pakistan/education

World Economic Forum. (2024). Global gender gap report 2024. https://www.weforum.org/publications/global-gender-gap-report-2024