RESEARCH NOTE

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Risk factors associated with Rohingya refugee girls' education in Bangladesh: A multilevel analysis of survey data

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Abstract

In Bangladesh, the world's largest refugee settlement currently shelters approximately one million Rohingya refugees who fled Myanmar to escape military persecution. Educating a significant number of young Rohingya, roughly half of whom are female, presents a significant challenge. Despite the presence of learning centres (LCs) across refugee camps, Rohingya girls may encounter specific barriers to accessing education due to exposure to various risks, such as violence, child marriage, and trauma stemming from past military oppression. This paper investigates the association between these risk factors and Rohingya girls' likelihood of attending LCs, and how this association may vary across refugee camps. Using survey data and employing three-level multilevel logistic regression models, I find that girls are less likely to attend LCs if they are at risk of encountering sexual abuse, child marriage, and psychological distress or trauma. These factors explain considerable variation in girls' LC attendance between camps and between households. In addition to providing more schooling opportunities to Rohingya children, prioritising girls' safety, protecting them from forced and child marriage, and supporting their psychological well-being require increased policy attention.

1 | INTRODUCTION

This study examines the barriers to educational access for young Rohingya refugee girls in Cox's Bazar, Bangladesh, home to nearly one million refugees in the world's largest refugee settlement (UNHCR [United Nations High Commissioner for Refugees], n.d.; Vince, 2020). Amid highly congested conditions, approximately 36% of these refugees, aged 5 to 17, fall within the primary and lower-secondary school age range (GoB [Government of Bangladesh] & UNHCR, 2023; IBE [International Bureau of Education], 2011). Educating this young population from the world's largest stateless minority (MacLean, 2019) remains a significant challenge. Traumatic experiences, including military persecution in Myanmar, exacerbate these challenges, with young girls particularly vulnerable to sexual violence, child marriage, and gender norms within refugee settlements (Haar et al., 2019; Nasar et al., 2022; Shohel et al., 2022). Using UNHCR (2021) survey data, this paper analyses factors hindering girls' access to education across the refugee camps in Cox's Bazar.

The study builds on previous research suggesting that while some low- and middle-income countries have favourable regulatory frameworks for refugees accessing education, others are less supportive or even prohibit access (Dupuy et al., 2022). Refugee education worldwide aims to provide quality education, a sense of belonging, and socioeconomic opportunities. Despite these noble goals, refugees often face exclusion from educational systems across different countries (Dryden-Peterson et al., 2019), exacerbating their existing vulnerabilities. I illustrate this issue by focusing on refugee girls.

1.1 | Rohingya educational facilities and barriers for girls

There are around 3400 temporary learning centres (LCs) providing education to Rohingya children in over 30 camps, with the United Nations Children's Fund (UNICEF) supporting 2800 of these centres (UNICEF, 2022). Despite these efforts, a significant disparity persists between Bangladeshi and Rohingya children in terms of being out of school due to various structural barriers such as limited funding, poor teaching quality, and the lack of credible curriculum certification (Rahman et al., 2022; Shohel, 2022). Figure 1 demonstrates that at the primary level, Rohingya children are about twice as likely to be out of school as their Bangladeshi peers, and around three times more likely at the lower- and upper-secondary levels.[1] To maintain a focused study on basic education, my analysis in this paper is limited to the primary and lower-secondary age groups.

Around 80% of Rohingya children aged 6 to 11 attend LCs with equal participation from girls and boys, although the gender gap widens as children approach ages 12–14 (UNICEF, 2022). Nonetheless, the Rohingya perceive these non-formal educational and skill-building initiatives as temporary (Habib et al., 2023; Hossain, 2023). Refugee children also frequently drop out due to mistreatment from their teachers and peers, which includes severe physical assaults for minor errors (Rahman et al., 2023). Besides these issues, girls' education faces specific risks due to various factors. For instance, financial instability and uncertainty about settlement and citizenship contribute to a higher risk of prevalent child and forced marriage among girls (Melnikas et al., 2020; Uddin, 2021). Research shows widespread child marriage among Rohingya girls, influenced by perceptions of maturity, insecurity, family honour, preference for younger brides, and lax enforcement of the legal marriage age (Islam et al., 2021).
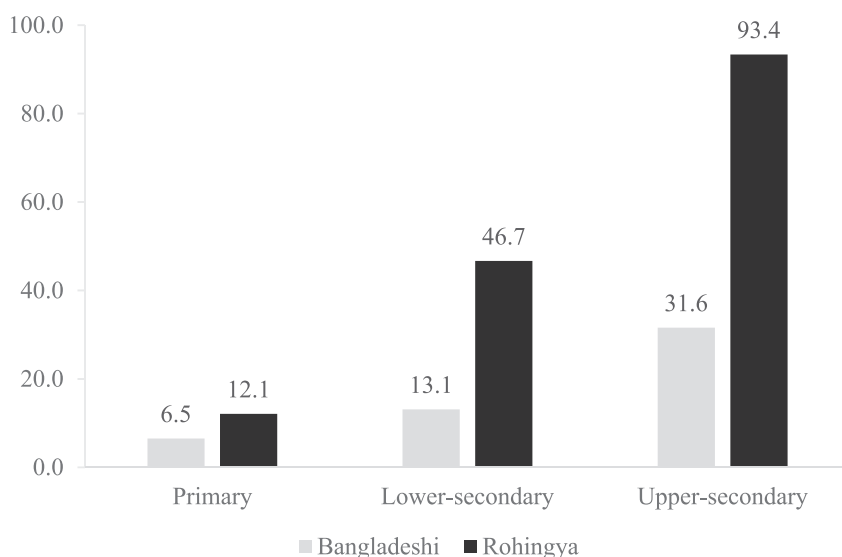
F I G U R E 1 Out-of-school children among Bangladeshis and Rohingyas. *Note*: I estimate out-of-school children based on the definition of the UNESCO Institute for Statistics (UIS) (n.d.). This means the proportion of children or young people in the official age range for a given level of education (e.g., primary) who are enrolled in school irrespective of the level. In Bangladesh, the official age range for education spans from 6 to 10 for primary, 11 to 15 for lower-secondary, and 16 to 17 for upper-secondary levels. However, the UNHCR data used for Rohingya children do not have a numeric age variable, but age categories. Hence, I used the available age range of five to nine for primary, 10–14 for lower-secondary, and 15–19 for upper-secondary education. While the age range slightly varies, the statistics overall do not deviate from the narratives in other sources (e.g., UNICEF, 2022). UNICEF (2019) and UNHCR (2021). UNESCO, United Nations Educational, Scientific and Cultural Organization; UNHCR, United Nations High Commissioner for Refugees.

Girls are often excluded from school as they are expected to prioritise household chores, reflecting societal norms (UNICEF, 2022). This expectation is reinforced by the fear and trauma associated with facing sexual violence outside the home while residing in Rakhine State, Myanmar (Haar et al., 2019; Rahman et al., 2023). Furthermore, Rohingya women and girls reportedly face sexual harassment from employers, violence at home from various sources including family members, community members, and camp authorities, and are sometimes coerced into prostitution due to economic hardship (Akhter & Kusakabe, 2014; Guglielmi et al., 2020). Reflecting on the above discussion, I investigate three research questions in the study.

1. How far are different risk factors associated with the attendance of Rohingya girls at LCs?
2. To what extent do these risk factors interact with each other in influencing girls' attendance at LCs?

The second question explores how the combined effect of risk factors, such as sexual violence and child marriage, influences girls' participation.

3. How do the risk factors contribute to differences in attendance at LCs between camps and households?

The third question reflects that with over 30 Rohingya refugee camps in Cox's Bazar district (UNOCHA [United Nations Office for the Coordination of Humanitarian Affairs], 2022), it is likely that educational resources and risk factors vary across these sites. Moreover, refugee camps are often viewed through a unidimensional lens. To better understand the microelements, it is essential to conduct a more thorough analysis of the different facilities and community characteristics within and between camps.

2 | DATA AND METHOD

In this study, I utilise the UNHCR (2021) survey collected from 15,935 individuals in 3165 households and 33 refugee camps, which was made available upon my request. The sample was designed to be representative of the Rohingya population at the camp level (UNHCR, 2021).[2] For this study, I narrowed the analysis to two age groups: (1) 5–9 years old and (2) 10–14 years old. The dataset only includes discrete categories for age and these two age groups approximately correspond to the primary and lower-secondary education age ranges in Bangladesh. Primary education in the country spans ages 6 to 10, while lower-secondary education covers ages 11 to 15 (with junior secondary spanning ages 11 to 13 and secondary covering ages 14 to 15) (IBE, 2011). Hence, my analysis predominantly includes children in the primary and lower-secondary education age brackets. While I mainly focus on girls, I also conduct analyses on boys to compare results (presented in the online supplement). The small number of missing observations for girls constitutes less than 0.1% of the total.

2.1 | Variables

2.1.1 | Attendance at LCs

The dependent variable in the study is whether primary and lower-secondary school-age girls attended LCs or not during the survey conducted in January 2019 (UNHCR, 2021). I create this variable by combining two binary indicators in the dataset: attendance at (1) a non-religious LC run by a nongovernment organisation (NGO) or the government, or (2) a religious learning space such as a madrasah (Islamic school). These facilities are provided by UNICEF, the Government of Bangladesh, and other NGOs (UNICEF, 2022). Table 1 illustrates that boys are more likely to attend LCs than girls.

2.1.2 | Risk factors

I include nine indicators of risk factors as the main independent variables in the study. These are binary variables indicating whether a girl is at risk of experiencing (1) sexual abuse and violence, (2) child marriage, (3) psychological distress or trauma, (4) child labour, (5) recruitment by armed groups, (6) being kidnapped, (7) violence in the community, (8) violence within the home, and (9) unsafe shelter. Child marriage (2) in the analysis indicates whether any individuals under the age of 18 within the household are currently married or about to be married. I use this as an indicator of potential risk since the normalisation of child marriage within the household may increase future risks. Additionally, I consider a binary variable denoting whether the shelter is unsafe for girls (9) as unsafe living conditions may pose a threat to their overall well-being. Table 1 presents the summary of the descriptive statistics showing that compared to boys, girls tend to be at a greater risk of experiencing certain factors such as sexual abuse/violence, child marriage, psychological distress and trauma, and violence at home.

2.1.3 | Control variables

I incorporate five control variables in the analyses, which are disability status, engagement in income generation activities, receiving remittances, age group, and household size. Additional details about these variables and the rationale for their inclusion are provided in Supporting Information S1: Appendix S2 of the online supplement.

TABLE 1 Summary of the descriptive statistics.

	Girls		Boys	
	Mean/%	Standard deviation	Mean/%	Standard deviation
Attended learning centre	0.80	0.40	0.89	0.32
Age group of individuals				
5–9	0.57		0.56	
10–14	0.43		0.44	
Risk factors for girls and boys, respectively				
Sexual abuse/violence	0.48	0.50	0.03	0.17
Child marriage at home	0.12	0.32	0.11	0.31
Psychological distress or trauma	0.16	0.37	0.12	0.33
Child labour	0.04	0.21	0.11	0.31
Recruitment by armed groups	0.14	0.35	0.35	0.48
Kidnapping	0.55	0.50	0.70	0.46
Violence in the community	0.32	0.47	0.55	0.50
Violence within home	0.20	0.40	0.08	0.28
Unsafe shelter	0.05	0.21	0.03	0.16
Other variables				
Any household members worked in 30 days	0.34	0.47	0.34	0.47
Household received remittances	0.92	0.47	0.92	0.28
Individual has disability	0.004	0.06	0.004	0.06
Household size	6.14	1.73	6.19	1.70
Individuals	2200		2359	
Households	1540		1556	
Campsites	33		33	

Notes: (a) Descriptive statistics are weighted by household survey weights except the number of observations. (b) The percentage of the 'yes' or discrete response is reported for all variables apart from 'household size'.

3 | ANALYTICAL STRATEGY

To address RQ1 by examining the association between different risk factors and Rohingya girls' attendance at LCs, I employ three-level multilevel logistic regression models (also known as mixed-effects models). Level 1 includes individuals or children nested within households at level 2, which, in turn, are nested within refugee camps at level 3. I fit Equation (1),

$$\text{Logit}\left(\text{Pr}\left(A_{ijk} = 1\right)\right) = \alpha + \boldsymbol{\beta}_1 \boldsymbol{R}_{ijk} + \boldsymbol{\beta}_2 \boldsymbol{Z}_{ijk} + u_j + r_{ij} \tag{1}$$

where A is the outcome variable indicating attendance at an LC by an individual $_i$ in household $_j$ and refugee camp site $_k$. The expected outcome in this logit model is the probability of the response being equal to one, $A_{ijk} = 1$, given the predictors in the model. The standard assumption in the model is that A_{ijk} has a Bernoulli distribution. α

is an intercept, β_1 is a coefficient vector for the nine risk factors R_{ijk}, and β_2 is a coefficient vector for the control variables Z_{ijk}, as described in the variable section. u_j is the camp-level variance component with a distribution of $u_j \sim N(0, \sigma_u^2)$ and r_{ij} is the household-level random intercept with a distribution of $r_{ij} \sim N(0, \sigma_r^2)$.

To address RQ2 about the interaction of risk factors and their association with attendance in educational facilities, I fit Equation (2). Here,

$$\text{Logit}\big(\text{Pr}\big(A_{ijk} = 1\big)\big) = \alpha + \beta_1 R_{Aijk} + \beta_2 R_{Bijk} + \beta_3 \big(R_{Aijk} \times R_{Bijk}\big) + \beta_4 Z_{ijk} + u_j + r_{ij} \tag{2}$$

β_3 is a coefficient vector showing the interaction effects between different risk factors, that is, R_A and R_B.

To address RQ3 about the extent to which risk factors explain variation between camps, I, first, examine the random variance components of u_j. Specifically, I check whether adding risk factors and control variables to different models changes the estimated variances. I also visually illustrate (in the online supplement) the relationship between the proportion of girls experiencing different risk factors in each camp and the camp mean of the predicted attendance at LCs. I compute the predicted attendance after running regression using Equation (1).

4 | FINDINGS

4.1 | RQ1: Risk factors and attendance at LCs

Findings suggest that girls who are at a higher risk of certain issues are less likely to attend LCs than those who do not face similar risks. Specifically, as illustrated in Table 2, Rohingya girls are about 3% points ($p < .05$) less likely to attend LCs when they experience sexual abuse and violence. This relationship persists even after controlling for other factors in model 3 and incorporating camp fixed effects in model 4. The inclusion of camp fixed effects allows me to account for any unobserved camp-specific characteristics that may potentially bias the results. The probability of attending educational facilities becomes even lower, 14% points ($p < .001$), when girls experience child marriage at home. However, once I add controls to the model the probability becomes 4.4% points ($p < .05$). Moreover, I find that the risk of experiencing psychological distress or trauma lowers the probability of girls' access to education by 7.7% points ($p < .01$) before adding any controls and 5.4% points ($p < .05$) after controlling for relevant characteristics, and camp fixed effects. Other risk factors such as child labour, recruitment by armed groups, kidnapping, violence within the community and family, and unsafe shelter do not appear to be significantly associated with attendance at LCs. Nonetheless, I observe that disability is strongly associated with a decreased chance of attendance by around 37% points ($p < .001$), which stands at 39% points after using camp fixed effects. The proportion of disabled children is very low in the study as shown in Table 1, yet they tend to be largely excluded from receiving education.

As mentioned, I also provide results analysing how similar risk factors might be associated with LC attendance by Rohingya boys. As shown in Table S1 of the online supplement, results are different for boys. I find that boys who have experienced child marriage at home and psychological distress or trauma are less likely to attend LCs. The result is surprisingly reversed for the risk of sexual abuse/violence, as it appears to be correlated with higher attendance among boys. One possible explanation for this is that engaging in learning activities may provide boys with a means to avoid or cope with the risk of violence. Consequently, being at a higher risk may motivate them to attend LCs more regularly.

Overall, the risk of experiencing sexual abuse and violence seems to play a distinctive barrier to girls' engagement in learning activities, a trend not observed among boys.

TABLE 2 Risk factors associated with school attendance of Rohingya girls (age 5–14).

	Dependent variable: Predicted probability of attending school			
	(1) Baseline	(2) + Risk factors	(3) + Controls	(4) + Camp fixed effects
Risk factors for girls				
Sexual abuse/violence		−0.031*	−0.033*	−0.032*
		(0.016)	(0.016)	(0.016)
Child marriage at home		−0.14***	−0.044*	−0.048*
		(0.022)	(0.022)	(0.022)
Psychological distress or trauma		−0.077**	−0.057*	−0.054*
		(0.023)	(0.022)	(0.023)
Child labour		−0.037	−0.040	−0.039
		(0.038)	(0.037)	(0.037)
Recruitment by armed groups		−0.027	−0.030	−0.028
		(0.024)	(0.024)	(0.025)
Kidnapping		−0.00068	−0.0055	−0.0050
		(0.016)	(0.016)	(0.016)
Violence in the community		0.0070	0.021	0.018
		(0.016)	(0.016)	(0.016)
Violence within home		−0.00016	−0.0033	−0.0044
		(0.020)	(0.020)	(0.020)
Unsafe shelter		0.0035	0.012	0.010
		(0.036)	(0.036)	(0.036)
Other variables				
Individual has disability			−0.37***	−0.39***
			(0.11)	(0.11)
Household member(s) worked in 30 days			0.021	0.021
			(0.016)	(0.016)
Household received remittances			−0.053	−0.055*
			(0.027)	(0.028)
Household size			0.0091*	0.0092*
			(0.0044)	(0.0045)
Age group: 10–14 (ref: 5–9)	−0.41***	−0.40***	−0.41***	−0.41***
	(0.020)	(0.020)	(0.020)	(0.017)
Camp fixed effects				Yes

(Continues)

T A B L E 2 (Continued)

	Dependent variable: Predicted probability of attending school			
	(1) Baseline	(2) + Risk factors	(3) + Controls	(4) + Camp fixed effects
Random effects				
Σu (camp location)	0.099	0.093	0.10	
	(0.058)	(0.056)	(0.059)	
Variance explained (%)		6%	0%	
Σr (household)	0.44	0.39	0.11	1.3e-32
	(0.31)	(0.30)	(0.35)	(6.2e-17)
Variance explained (%)		37%	27%	
Individuals	2200	2200	2200	2200
Households	1540	1540	1540	1540
Camps	33	33	33	33

Notes: (a) Marginal effects are presented, instead of log odds, for all the covariate coefficients, that is, coefficients above the 'Random effects' line. The coefficients can be interpreted in terms of the predicted probability of girls' attendance at LCs. (b) Variance explained compared to the baseline model (model 1). (c) Model four is based on a two-level model while using camp fixed effects. (d) $*p < .05$ $**p < .01$ $***p < .001$.

4.2 | RQ2: Interplay of risk factors and attending LCs

Based on the analysis in RQ1, I examine the interaction between three risk factors and their association with attending LCs. Here, I mainly interact the risk factors that appear significant in Equation (1) to further examine whether they have a compounded effect. These are: risks of sexual violence/abuse, child marriage, and psychological distress/trauma.

As presented in Figure 2, the results are consistent across three sets of interactions. Specifically, when Rohingya girls are both likely to be at risk of experiencing sexual violence/abuse and distress, they are least likely to attend LCs compared to other groups. This is the same when girls are both at risk of experiencing sexual violence/ abuse and child marriage, and distress and child marriage. Additionally, I include the results from interactions involving risk factors found non-significant as robustness checks in Figure S1 of the online supplement. The interaction effects are predominantly non-significant for other combinations, including those shown in Figure S1.

Nevertheless, in contrast to the findings for girls presented in Figure 2, I find different results in the case of boys. As exhibited in Figure S2 of the online supplement, the probability of attending LCs does not significantly differ by the interaction between the risk of experiencing sexual violence and distress, and between sexual violence and child marriage. The interaction between the risk of distress and child marriage shows that both those who are and who are not at risk of being distressed are significantly less likely to attend LCs irrespective of their risk of child marriage (with the risk being slightly higher for those facing child marriage).

In brief, the interplay of the risk of sexual abuse, child marriage, and psychological distress may likely compound the effect and reduce the likelihood of girls' attendance at LCs. This is not the case for Rohingya boys.

4.3 | RQ3: Risk factors accounting for camp variations in attending LCs

As shown in Figure 3, there is a significant variation in girls' attendance at LCs among refugee camp sites. The random intercept (u_j) in Table 2 also confirms this variation. The random effects part of Table 2 further shows
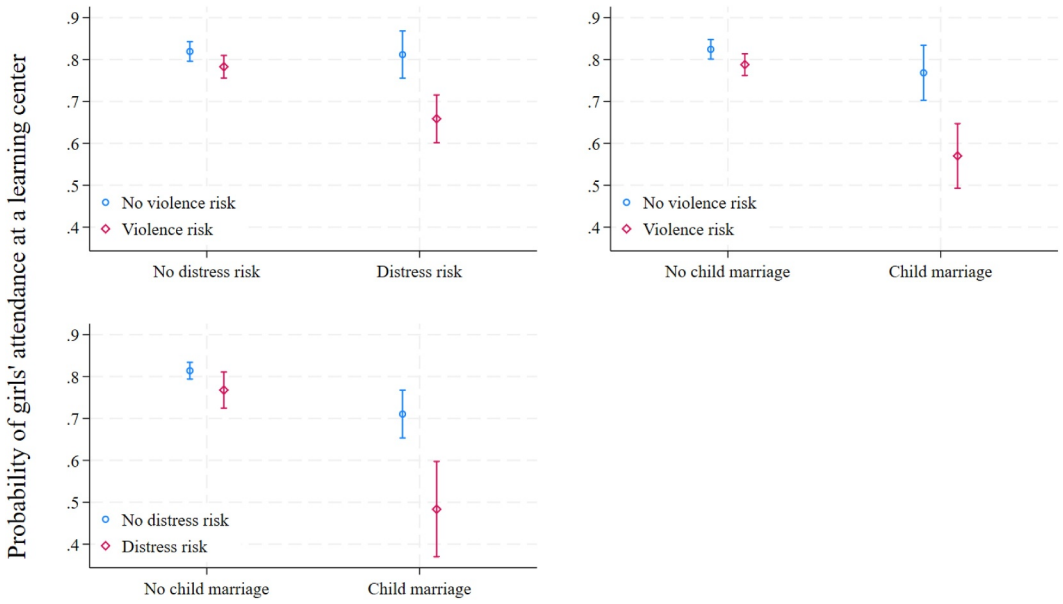
FIGURE 2 Interaction between different risk factors for girls and their probability of attending a learning centre (LC). *Note*: This graph is estimated based on Equation (2).
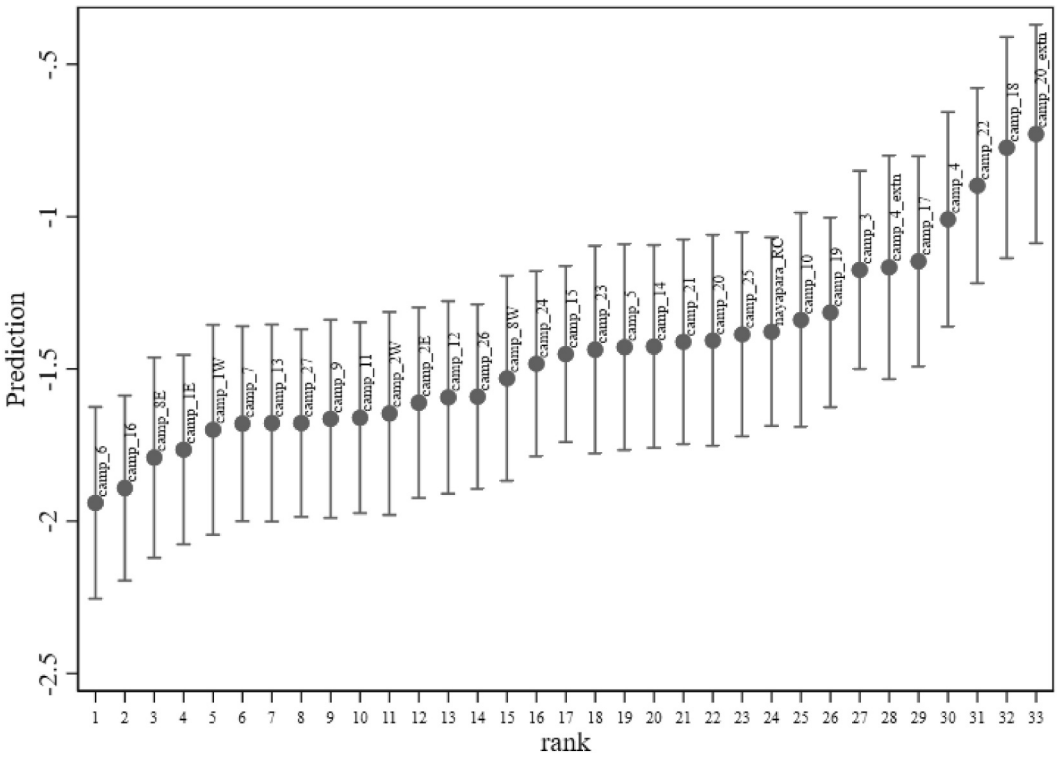

FIGURE 3 Random intercept predictions of refugee camp ranking for girls' LC attendance. *Note*: This caterpillar plot is estimated based on model three in Table 2. Camp identifiers are shown on the right side of the 95 percent confidence intervals (CIs).

that after introducing risk factors into model 2, they explain around six percent of the between-camp variation in girls' attending LCs compared to the baseline model. However, once I control for other characteristics in model 3, risk factors no longer explain between-camp variance. Furthermore, risk factors explain about 37% between-household variation in girls' attending LCs, while additional controls in model 3 do not explain any further variance. These results are quite similar in the case of boys as shown in Table S1 of the online supplement. The only difference is that the risk factors account for around 47% between-camp variation in boys' LCs attendance. Additionally, the use of camp fixed effects is associated with a notable decrease in the between-household variation in girls' attendance at LCs, almost to the point of being negligible. This indicates substantial disparities in girls' LC attendance between households within certain camps. Camp fixed effects also decrease the household variance for boys' LC attendance.

To further examine RQ3, I plot the proportion of the three risk factors in each of the 33 camps (that appear significant in Table 2) against the camp mean of the predicted probability of girls' attendance at LCs. As presented in Figure S3 of the online supplement, I find a negative association between the risk of sexual abuse and child marriage and decreased LC attendance of girls. This indicates that certain risk factors vary across Rohingya refugee camps and are associated with a lower propensity of girls attending LCs. These findings support the results regarding the between-camp variation in LC attendance explained by the risk factors. However, the association between distress and attendance at LCs is weaker. For boys, as presented in Figure S4 of the online supplement, I do not see any association between sexual abuse risk and LC attendance, while the association is weaker for child marriage and moderate for distress.

Taken together, certain refugee campsites may pose a higher risk for Rohingya children, especially for girls when it comes to sexual violence. This has implications for their LC attendance and overall well-being.

5 | CONCLUSION

This study examines how various risk factors are associated with hindering the education of Rohingya girls aged 5 to 14 in refugee camps. Findings demonstrate that girls facing risks including sexual abuse, violence, child marriage, and psychological trauma are less likely to attend educational facilities. There is also notable variation in these risks across camps, affecting girls' attendance at LCs. Camp fixed effects explain significant between-household variation in girls' attendance. Given the vulnerability of young and adolescent girls to gender-based violence and trafficking, addressing these risks is crucial for improving their education prospects. These findings hold particular significance for enhancing girls' education in refugee camps with limited resources.

Refugee children are caught between the normative aspirations of global commitment to upholding universal human rights and the practical realisation of these rights in daily life (Dryden-Peterson, 2016). Although refugee education globally aims to secure a better future for refugee children (Dryden-Peterson et al., 2019), the reality, in many countries, differs (Dupuy et al., 2022), as demonstrated by this study. Removing structural barriers to education for Rohingya girls and supporting them through multiple means would help bridge this gap. The study emphasises the urgent need to address the safety, susceptibility to sexual abuse and exploitation, and the prevention of child marriage among Rohingya girls.

Additionally, the risk factors for Rohingya girls may have intensified during COVID-19, including school closures, increased poverty, limited external assistance, and exacerbated vulnerability to the pandemic (Guglielmi et al., 2020; Reidy, 2020). Despite the reopening of LCs, the likelihood of girls dropping out has risen due to pandemic-related risks (Gjerløw et al., 2022). Future research could investigate the pandemic's long-term impact using comprehensive survey data. Moreover, qualitative or mixed-methods approaches may provide insight into the complexity of these risk factors beyond binary measures. Additionally, further research could explore whether the findings of this study apply to other refugee camps, particularly in low-income contexts.

ACKNOWLEDGEMENTS

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from https://microdata.unhcr.org. The data are not publicly available due to privacy or ethical restrictions.

ENDNOTES

[1] This comparison, however, does not imply that the schooling facilities for Rohingya are comparable to those for Bangladeshi children. It is intended to provide an overview of exclusion despite the establishment of LCs.

[2] See Supporting Information S1: Appendix S1 of the online supplement for more details.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.