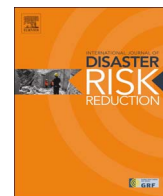




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Handheld solar light use, durability, and retention among women and girls in internally displaced persons camps in Haiti — 2013–2014



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ABSTRACT

During conflict and disasters, women and girls are at increased risk of gender based violence. International humanitarian guidelines call for the distribution of individual lighting to meet women and girls' basic needs and to reduce risk of violence; however, little evidence exists to support these guidelines. This paper presents an evaluation of handheld solar light use, retention, and durability among women and girls living in two internally displaced persons camps in Port-au-Prince, Haiti. Data was gathered prospectively via five household surveys from August 2013 to April 2014; a total of 754 females participated in the study. Women reported going outside at night more frequently at the end of the study than at the beginning. The handheld solar lights were the most common source of lighting at endline, whereas candle and gas lamp use declined significantly over time. Results from a Life-Table survival analysis estimated that households had an 83% probability of still owning a functioning light after seven months. Given the frequent use, acceptable durability, and retention of the lights, donors and humanitarian organizations should consider supporting light distribution to women and girls in internally displaced persons camps to help meet their basic needs.

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1. Introduction

Key actions are needed to integrate the protection principles of safety and dignity and avoidance of harm in the delivery of humanitarian assistance to conflict and disaster affected populations. The Sphere Project Humanitarian Charter and Minimum Standards in Humanitarian Response first addressed artificial lighting specifically for protection in 2004, with refinement of the guidelines in 2011 [1,2]. Both the Sphere and Inter-Agency Standing Committee Guidelines for Gender Based Violence suggest key strategies to minimize night-time risks including installing overhead lights, distributing personal handheld flashlights, incorporating a buddy system, and advocating for regular monitoring by community watch and security personnel [1–3]. While the recommended types of lighting have transitioned from candle and lantern use to the inclusion of light emitting devices (LED), the underlying reason for providing them has not – for personal safety

in the house and when visiting the latrine and engaging in other night-time activities [1,2].

1.1. Gender based violence risk for women and girls

During conflict and disasters, women and girls are at increased risk of gender based violence due to the exacerbation of gender inequities and the destabilization or destruction of systems that usually protect them [3,4]. Specifically, women and girls may experience sex trafficking, forced labor, sexual coercion, and may be approached for sexual acts in exchange for assistance and protection. When displaced, women and children may be subjected to gender based violence by persons in authority or approached for sexual acts in exchange for protection and assistance. They are vulnerable when using communal water and sanitation facilities, during food distributions, and fuel collection, particularly at night or in dark places [5]. Some of the contributing factors for gender based violence during displacement include loss of security, lack of economic livelihoods, alcohol, drug use, psychological trauma, disrupted roles within the family and community, and lack of knowledge about one's individual rights [6].

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1.2. Gaps in the research evidence

Little research has been conducted, however, on the effectiveness of interventions on risk reduction to violence [7–11], and information on how to implement and measure the impact of interventions in local contexts is limited [12]. Recently, governments and United Nations agencies have taken important steps towards decreasing risks due to gender based violence among women and girls affected by conflict and disasters. For example, the United States National Action Plan on Women, Peace and Security released in November 2011 attempts to empower and protect women through designing and implementing relief to recovery assistance activities in ways that reduce the risks and consequences of gender based violence [13]. Evidence has shown that when more emphasis is placed on promotion and inclusion of women in humanitarian assistance, gender based violence programs have a greater chance of success [14].

Due to the potential heightened vulnerability of women and children at night and in dark areas, it has been suggested that distribution of solar lights to displaced people may improve sense of safety and risk from physical and sexual violence [15–22]. Other suggested benefits of solar lights include one's ability to see animals or insects [23,24], homework study conditions for children [15–17,23–27], access to economic opportunities [17,19,22,25,26], and reduce health hazards from fire and environmental pollutants [16,17,19,27]. While these and other unpublished reports describe the benefits of solar lights among displaced populations, there are no published research studies in peer reviewed literature that have attempted to describe and quantify how the lights are used in day to day life, how durable the lights are, and their impact on use of other sources of lighting and women and girls' sense of safety. Moreover, most evaluations have used focus group discussions or cross-sectional surveys to assess the impact of lighting which are limited in various respects. For example, focus group discussion participants are not selected at random and may provide answers they think the interviewer or other group members want to hear or will give them favorable treatment [28,29]. Cross-sectional surveys are done at only one point in time and do not allow for comparison of results longitudinally [30]. An additional constraint of current evaluations is that they have had short follow-up periods between distribution of lights and evaluation which limits information about the durability and retention of the lights over time [18,19].

Since 2010, the United States Agency for International Development Office of Foreign Disaster Assistance has received several requests to fund handheld solar lights as a means of preventing gender based violence in displacement settings. Limited evidence is available, however, on the outcomes of using solar lights in these settings. For example, will women and children find the lights acceptable to use? How often and for what purpose will the lights be used by women and children? Will the lights be durable enough over time to recommend their continued funding in post-humanitarian crisis environments? Solar lights cannot offer protection from gender based violence or improve sense of safety if women and children choose not to use them. Before the humanitarian community can justify continued funding of solar lights as a protection intervention, robust evidence is needed that demonstrates acceptability and use of the lights by women and children, and the durability of the lights over time.

1.3. Post-earthquake Haiti

The 2010 earthquake that struck Port-au-Prince, Haiti, resulting in the deaths of over 230,000 people [31]. The International Rescue Committee's gender based violence assessments in post-earthquake Haiti in 2012 identified increased risks to women and

girls living in internally displaced persons camps in Port-au-Prince, Haiti. Key findings showed poor lighting, congested sleeping spaces, and a lack of appropriate bathing facilities, hygiene materials, and shelter [21,32].

1.4. Evaluation study of handheld solar lights

In an effort to help fill the research gaps, an evaluation was carried out with the goal of documenting the use and benefits of handheld solar lights and to explore the sense of safety among females aged 14 years and older living in two camps in Port-au-Prince, Haiti. These two internally displaced persons camps were constructed in the aftermath of the 2010 earthquake. The purpose of the current paper is to use survey data to describe the use, durability, and retention of handheld solar lights in order to build the research evidence to ensure that the humanitarian community has the most effective tools and guidelines in place.

2. Methods

2.1. Study design and site selection

A mixed methods study design guided by The Centers for Disease Control and Prevention's Framework for Program Evaluation in Public Health was employed to gather qualitative and quantitative data prospectively over a 9-month period (August 2013–April 2014) [33]. We conducted one household survey at baseline, three household monitoring surveys and one endline survey. We also conducted eight focus group discussions at baseline and eight at endline with a total of 80 and 82 participants, respectively. While both qualitative and quantitative data were collected during the course of the study, this paper focuses on the quantitative findings. The protocol was approved by the Haitian Ministry of Public Health and Population.

The evaluation was carried out in Camp Toto and Camp Sinai because they had (i) an existing IRC program, (ii) an existing formal camp management system, and (iii) camp stability, defined as the camp was scheduled to remain open for the duration of the evaluation. The two camps had a combined population of 5783 (Toto 4297; Sinai 1486), with an estimated 2057 females aged 14 and older in July 2013. Camp Toto had large solar panels for street lighting and Camp Sinai lacked street lighting. Eligible participants in the evaluation were (i) females aged 14 and older, (ii) living in households in the two camps, and (iii) who spoke Haitian Creole.

The International Rescue Committee distributed the d.light S300 Solar Lantern per household in September 2013 after the baseline survey [34]. This model of light was selected due to preference among women in Port-au-Prince during a rapid trial period and the availability of the lights locally [35].

2.2. Sampling frame and sample size calculations

The sampling frame and sample size calculations for the evaluation were based on the March 2013 International Organization for Migration Camp Registration Database. The sample size was calculated separately for the two main evaluation indicators (i) light use and (ii) light retention. We also took the sense of safety indicator into consideration when calculating sample sizes; however, it is not the focus of this paper.

A Kaplan-Meier survival function approach was used to estimate the change over time in light use and light retention indicators using no adjustment for an infinite population. Simulations estimated the change of each indicator and the precision of survival probabilities over time for different sample sizes. Using a fixed sample size of 300 females for Camp Sinai due to a limited

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