IBT Journal of Business Studies (IBT-JBS)
E-ISSN: 2409-6520; P-ISSN: 2414-8393
Volume 21.2 210-230 (2025)
DOI: 10.46745/ilma.jbs.2025.21.02.04

Translating Workplace Safety To Home: A Butterfly Effect Perspective On Domestic Injury Prevention In Pakistan Navy

Zaeem Shabbir[1*]

Abstract

Pakistan Navy (PN) places a lot of emphasis on safety of its men and material at its workplaces, enforcing through standard operating procedures, drills, and structured protocols. On the other hand, safety of PN personnel, their families and belongings, within domestic settings does not get the same level of attention: it largely remains informal and individually driven, despite the fact that minor neglects at home can produce serious and often preventable consequences. Building on the aforesaid gap, this study contrasts workplace and domestic safety and demonstrates that minor household oversights often escalate into significant human and organizational losses. This study uses a qualitative, exploratory approach, using behavioral safety literature and the butterfly effect to examine how minor domestic oversights can escalate into serious outcomes. The analysis is based on five years data of Establishment Occurrence Reports occurring in Naval Residential Complexes, supplemented by selected contextual observations from the Pakistani domestic environment. The study argues that while organizational measures are being undertaken by PN to improve safety at homes; domestic safety cannot be monitored or enforced in the same manner as workplace practices. Therefore, individual's awareness and personal responsibility should be prime focus of organizational efforts so as to enable the occupants to timely identify and respond to emerging hazards in everyday situations. The study stresses that most of the domestic accidents can be mitigated through simple, low-cost interventions and concludes by offering practical and policy-level recommendations to integrate domestic injury prevention into broader preventive safety and public health framework of PN.

Keywords: *safety at home, domestic safety, butterfly effect, pakistan navy, preventive safety measures, public health, organizational safety measures.*

Author's Affiliation:
Institution: PNEC, National University of Sciences & Technology, Islamabad, Pakistan[1]
Country: Pakistan
Corresponding Author's Email: *zaeemff@hotmail.com

1. INTRODUCTION

In Pakistan Navy (PN), like all military institutions, workplace activities inherently involve a high degree of risk. Whether it is the naval operations (at sea, in air, or on land), maintenance routines in dockyards, or logistics activities at depots; safety is continuously ensured through structured, institutionalized, and consciously emphasized practices so as to accomplish assigned tasks with an aim not to get into any untoward incident. The existing safety practices within PN align closely with DuPont's safety management philosophy which emphasizes on leadership commitment, procedural discipline, and personal responsibility to build a robust safety culture in an organisation (Klein, 2009). The aforesaid practices also act as interventions in Reason's Swiss Cheese Model (1990a, 1990b); by maintaining multiple layers of defense, safety practices help to prevent the alignment of latent hazards into active failures. Thus, in a bigger picture, safety efforts at workplaces help in promoting a culture wherein safety is understood as a shared organizational responsibility and risks are systematically identified and mitigated (Zohar, 1980).

However, once people come outside their workplace, the formal safety architecture mostly fades away. Unlike safety at workplace, safety at homes is informal, unsupervised, and loosely observed; driven by habits and led by individuals through vague routines, rare reminders, casual talks, and minimal training. This transition from organization-led efforts (at workplace) to individually-driven behaviors (at homes) marks a fundamental shift in safety responsibility and often leads to an inconsistent approach to management of risks at homes (Hofmann & Morgeson, 1999; Hasle & Limborg, 2006).

While homes are perceived as familiar spaces free of obvious hazards (Ibrahim, 2019), this is not always the case. Small omissions (such as exposed electrical wiring, unsecured gas cylinders, poorly stored chemicals, or children left unsupervised, etc.) can result in some serious, preventable incident (Doran et al., 2014). Such risks are often underestimated because they are part of our daily routines, making them less noticeable and reducing the chances of triggering requisite preventive actions. As Burrell et al. (2006) noted, an accident involving the family of a military person is not merely a private matter; it drains organizational resources, compromises broader institutional welfare; and by impairing mental focus, it has all the potential to disrupt operational readiness. Thus, cultivating a safety mindset at home is not just a personal concern but a matter of institutional relevance to PN. Although there has been an increasing attention to workplace safety in PN, the topic of domestic safety in Pakistani cantonments (of Army, Air Force, as well as PN) remains unexplored; to the author's best knowledge, this is the first study that explores safety at homes of PN personnel.

Lund and Hovden (2003) took a comparative study to investigate whether safety-focused workplace behavior translates to non-work environments. They found that, in most cases, personnel did not carry over the safe behavior (at workplace) into their domestic places unless targeted interventions were put in place. Notwithstanding, several of personnel did transfer emergency preparedness habits into their homes, extent varying according to their personal preferences. The aforesaid findings

raise a pertinent question: even if PN has a deeply embedded safety culture at the workplace, what deliberate efforts are needed to extend that awareness into the homes of its personnel? Can institutional reinforcement by PN alone suffice? Or must the officers, CPO/sailors, and civilian personnel be deliberately instilled with a parallel sense of individual responsibility in domestic settings, where routines are personal and risks often go unnoticed?

1.1 Objectives

In order to address the above stated question, this paper presents a case for integrating domestic safety into the broader safety philosophy of PN personnel. The objective of this study is to examine domestic safety incidents within PN residential areas in order to identify recurring hazards and behavioral vulnerabilities, and to assess the limitations of organizational safety measures when applied to home settings, with a view to proposing practical, awareness-based preventive measures.

Based on the existing literature on behavioral safety as well as actual incidents within PN residential areas, examined through the conceptual lens of the 'butterfly effect', this research differentiates the structured safety paradigms of the workplace with the relatively informal and individually driven nature of household safety. It identifies a few recurring domestic vulnerabilities that, despite their low visibility, can be mitigated through simple, low-cost, and practical measures.

1.2 Scope

The scope of this study is delimited to domestic settings within (Pakistan) Naval Residential Complexes (NRCs) and cantonments. As compared to civilian public areas, cantonments function under a greater organizational influence by having embedded security, government-maintained infrastructure, regulatory compliance mechanisms, disciplined community norms, and assured emergency response. The organizational oversight creates an environment more conducive to safety interventions than civilian areas where such structured support is absent.

Furthermore, this research is limited to issues that directly affect the safety of families and their belongings within the home, specifically focusing on unintentional accidents and hazards. Wider public safety concerns (such as those encountered in parks, hospitals, or on roads) or measures related to crime, natural disasters, etc. fall outside the scope of this discussion. Aligning with the butterfly effect, this study has shortlisted and focused on those incidents from the PN domestic occurrences[1] data of past five years that demonstrate the principle of 'small causes, large arrangements, aiming to identify low-effort interventions that can lead to substantial safety improvements.

2. LITERATURE REVIEW

This section presents some of the literature, relevant to this study including a discussion on safety, domestic safety, butterfly effect and their interlinkages. This helps build an understanding, prior delving towards the data part and its descriptive

analysis.

2.1 Safety

Talking of the term safety, there is no universally agreed definition and it remains a subject of active debate within research community. This lack of consensus (on what is safety) makes it harder to communicate ideas clearly as well as epistemic advancement (Vandeskog, 2024)[2]. PN Manual of Safety (2016, Article 0103) defines the term, safety as "freedom from danger, unacceptable[3] risk and injury". This definition is a military-specific version of the traditional 'Safety-I' concept, which focuses on preventing failures or undesirable outcomes (Cooper, 2022; Aven, 2022; Vandeskog, 2024, p. 107)[4]. Furthermore, Raheemay et al. (2025) are of opinion that this definition is past-oriented and places emphasis on absence of negative outcomes rather than the conditions that maintain the well-being. Also, this definition views safety as an "epiphenomenon" (i.e., a byproduct of some other process) rather than as a clearly measurable entity in its own self. Hence, this indirect, vague approach makes it difficult to evaluate or improve safety in a systematic manner.

Notwithstanding the above, this paper uses the safety definition adopted by PN. The reasons are twofold: first, redefining safety does not fall within the scope of this research. Secondly, an effort is being made to understand and improve the broader realities of the domestic safety risks and reach towards actionable recommendations/ interventions.

2.2 Domestic Safety

Rosewood Rehabilitation & Nursing (2025) defines home safety as "measures and practices" that are adopted to protect humans and belongings within home. In essence, the aforesaid broadly refers to various preventive measures against accidents, injuries, and damage to belongings and property at home. ISO (n.d.) refers to domestic safety as "minimizing of risks" during routine activities within the home. Therefore, domestic safety means ensuring the freedom within the home, which helps to protect the family members as well as our property and assets from harm or damage. While the term domestic safety is not explicitly defined by PN safety manual, domestic safety may be defined as, "freedom from danger, risk, and injury to residents and their belongings at homes". However, it is important to note that unlike military workplace activities, harm at home comes not from explicitly risky but from seemingly benign, routine everyday conditions. Such trivial oversight can lead to serious consequences - a phenomenon known as the 'butterfly effect.

2.3 Butterfly Effect & Domestic Accidents

The term, "butterfly effect" was coined by Dr Edward Lorenz (a US meteorologist and mathematician) to describe the "sensitive dependence of nonlinear systems on initial conditions, wherein slightest variations at the start of a process may create much different outcomes" (Lorenz, 1972). In other words, it denotes the vastly

different outcomes through minute differences in input (Lorenz, 1963). The concept has since been applied to various fields, like medicine, psychology & behavioral science and economics & finance, as well as safety (SAFRAN, 2025; Klasen & Lingard, 2021; Stewart, 2000).

Many accidents occurring at homes are example of butterfly effect. For instance, consider an ordinary situation from daily domestic life: a maid was mopping floor as part of routine cleaning of house; she left a half-filled tub of water unattended in a room where an infant was playing nearby. As she left, the unattended infant crawled over to the tub, peered inside, fell in headfirst, and drowned[5]. The actions in the aforesaid case (mopping and having water in the tub) are benign, routinely done works during everyday household upkeep; however, their combination with a minor lapse (of leaving the infant momentarily unattended), led to the loss of a precious life. This tragic incident demonstrates the butterfly effect in domestic safety: how seemingly harmless actions of everyday, routine nature can result in grave consequences. Incidents like this demonstrate the butterfly effect by showing how simple neglect at home can quickly jeopardize safety to cause lifelong emotional trauma and psychological effects.

2.4 Latent Hazards & Domestic Vulnerabilities

Domestic vulnerabilities are the weak points and unsafe habits that form latent hazards in our homes. Several research works (Foettinger et al., 2022; Kulor et al., 2024; Lee et al., 2025) indicate that such hazards are mostly from items of everyday use or routine actions (such as unsecured furniture, overloaded electrical sockets, unattended stoves, or slippery floors); though often overlooked being trivial in nature, these may lead to serious accidents or emergencies. This happens because we tend to associate our homes with security and comfort, which makes us less likely to recognize potential risks.

According to the World Health Organization (WHO, 2018), home is a primary place for unintentional injuries particularly for the vulnerable groups (i.e., children, elderly, and persons with disabilities). WHO identifies common domestic hazards (i.e., falls, burns, poisoning, drowning, and cuts) as major contributors to morbidity and mortality within household environment. Within the scope of this PN specific research, slips trips and falls, fire risks, structural hazards, electrical faults, etc. have been shortlisted as specific domestic hazards, to be specially guarded against and are discussed later in this paper.

2.5 Pakistan Specific Studies

Presently no published research work exists on domestic safety in NRCs or military cantonments (in broader terms), although studies have been undertaken in Pakistani hospitals on injury/ accident cases. To avoid repetition, such studies have been mentioned and compared to PN EOR data, later in the text. Notwithstanding, two considerations are important, specific to Pakistan:

a). Pakistan is a 3rd world country with 45% of population living below International Poverty Line (IPL) of $3/day (Kiani, 2025). Joint family systems are common here and many households struggle with daily survival challenges in limited living spaces and insufficient resources. Resultantly, risk of domestic accidents increases in cramped spaces often making use of cheaper products, affecting a wide range of age groups (particularly vulnerable children, the elderly, and family members with disabilities). While PN personnel (as government servants) are normally paid above the IPL and enjoy government-funded amenities (such as medical treatment, house maintenance, etc.), the generally prevailing poverty mindset may hinder prioritization of expenditures on safety-related measures at home.

b). Secondly, in academic curriculum of Pakistani schools, safety topics are covered minimally, if not entirely absent (Nawaz et al., 2025; Shumaila et al., 2024). Thus, many individuals often do not fully appreciate the severity of risks until they have personally witnessed or experienced an accident, which subsequently makes them adopt a cautious behavior (Edouard et al., 2024). Even though, PN personnel continuously undergo safety activities, the general mindset prevalent in society carries an effect into PN domestic settings as well.

Thus, under the above-mentioned conditions, deliberate and conscious efforts are essential to promote the domestic safety.

2.6 Accident/ Incident Recording Mechanism in PN

PN maintains a strong, end-to-end system for the management of safety incidents, encompassing structured processes for reporting, investigation, and review of remedial actions. PN uses 'Occurrence Report' as the official mechanism for documenting incidents of operational, maintenance, training, personal, or miscellaneous nature within any of PN ships, submarines, aircraft, or establishments. The accidents happening in residential areas are recorded through Establishment Occurrence Reports (EORs).

3. RESEARCH METHODOLOGY

This study adopts a qualitative, exploratory research methodology to analyze 5 years EOR data from NRCs in order to identify recurring patterns and trends of safety accidents at homes of PN personnel. Contextual observations from the wider civilian community are also used sparingly to supplement PN data and enrich interpretation. Domestic hazards are identified through a review of EOR investigation reports along with the resulting safety measures currently undertaken by PN. Using the butterfly effect as filtering criterion, past accidents are sifted to identify and propose preventive measures that are relatively cheaper and easier to undertake but will prevent much bigger losses. The study proposes the hypothesis that these measures are predominantly organizational in nature, suited to workplace safety, but may not yield optimal outcomes when applied to domestic settings along with few practical and implementable recommendations.

4. DATA ANALYSIS & DISCUSSION

4.1 Trends from EOR Data

A review of 5 years EOR data from January 2020 to December 2024 reveals that 35% of all reported EORs originated from residential settings. The largest percentage of these domestic EORs (49%) were related to fire, with slips, trips, and falls being second (35%). Burns (8.5%), injuries from other causes (4.5%), and structural failures (3%) accounted for the remaining percentage of safety incidents at homes.

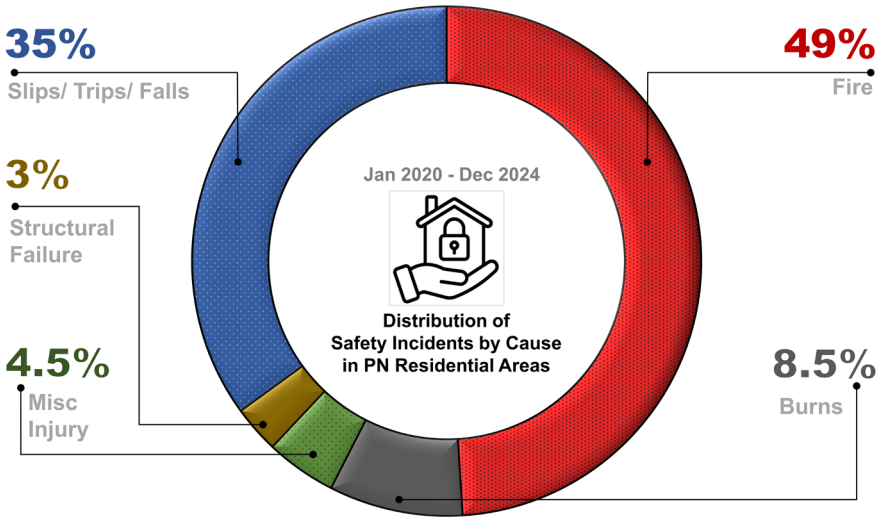

Figure 1. Categorization of 5-year Domestic EOR data

4.2 Pertinent Accidents

While the statistics reveal the frequency and nature of domestic accidents, they often fail to portray the severity of consequences suffered by effected individuals. The following examples and hazards illustrate how small, routine actions can escalate into an accident of grave results, underscoring the butterfly effect in the context of home safety.

4.2.1 Improper Storage of Hazardous Items

In January 2021, during the COVID period, the residents of a C-type house at an NRC in Karachi had kept petrol for generator in a 19 Liter plastic bottle inside store besides geyser. On the incident day, petrol was spilled and caught fire from geyser, trapping and burning the 10 years old child inside the store room. Fire extinguishers/ fire points were not in near vicinity; child's maid, her father, and few others respondents were not knowing of emergency phone numbers; and closure of sui gas shut-off valve was not timely ensured, which worsened the situation. Resultantly, fire was brought under control after 40 minutes and by that time the

child was completely burnt; a huge loss for a petty reason of improper stowage of petrol.

The above stated EOR originated from petrol; but most of flammable substances such as aerosols, alcohol-based detergents, cooking oils, become dangerous when exposed to heat, flames, or electricity. Similarly various hazardous items (like medicines, cleaning compounds, and sharp tools) are equally dangerous for children and an easily avoidable reason for accidents.

4.2.2 Dangerous Habits

Another example of the 'butterfly effect' comes from dangerous habits of children. In a PN household at an NRC in Karachi, a 4 years old child had habit of playing with matchsticks. One day, in January 2022, she accidently ignited a fire under a cot. Although there was no loss to life, but this dangerous habit caused significant financial loss of occupants as personal belongings were destroyed.

4.2.3 Hazards from Electronic Items

Charging of phones, tablets, or laptops on/ under heat trapping surfaces like blankets or pillows can overheat devices and trigger fires. In one such incident in one of the NRC at Karachi in June 2022, an individual placed his phone on charging atop a pile of clothes on the washing machine. Few minutes later, unknowingly, he threw more clothes onto same pile, fully covering phone & cutting off the cooling air flow resulting in heating and battery explosion followed by fire. Although there was no life loss, but this minor inattentiveness caused loss of government property as well as his personal belongings lying in vicinity.

4.2.4 Hazards to Children

The analysis reveals two issues with respect to the safety of children in NRCs. First one is falls whereas second one comes from lack of awareness on child proofing.

4.2.4.1 Falls

Falls remain the most common cause of unintentional injuries at a global level (WHO, 2018)[6]. According to a study undertaken by Faruque and Khan (2016) of 165 unintentional injury cases among children in Karachi, falls were found to be the most common mechanism, accounting for 39% of all cases (two-thirds happening within homes, mostly in living and bedrooms). A more recent study by Khan et al. (2022) in Karachi showed similar results. In the context of past incidents in NRCs, falls appear as frequent cause of injury, especially for infants and young children.

a). In one accident during July 2020, at a servant quarter of C-type flat in Islamabad, a 2½ year old child fell through 11" gap in grill from 2nd floor resulting in his death.

b). In another incident in November 2023, a 4-year-old child fell from a balcony at 2nd floor at Karachi. A chair had been placed on the balcony which the child climbed onto; she then tipped over the guardrail and fell, resulting in a fractured femur.

4.2.4.2 Child Proofing

Childproofing is the process of identifying potential hazards in a home before an infant begins to crawl. These preventive measures are typically minor, but if neglected, they can lead to accidents causing preventable injuries, illustrating the butterfly effect. (CPSC, n.d.).

In past 5 years, although no EOR was found that was directly linked to childproofing issues, the author observed a general lack of awareness amongst PN communities regarding proactive identification of household hazards and the adoption of basic precautionary measures to ensure safety of their infants and young children. Two specific measures merit mentioning:

a). In Karachi, a pilot study conducted in low-income neighborhoods revealed that over 55% of homes had stoves and pedestal fans accessible to young children, and nearly 48% kept water buckets within a child's reach, indicating prevalent, preventable injury hazards (U. R. Khan et al., 2013). Similarly, in many of homes in NRC, the electric sockets installed at low height, are dangerous to young children as they are accessible from the level where they sit, crawl, or play. The naturally curious infants may poke fingers & objects like spoon or their toys into exposed sockets; a serious hazard for electrical shock (CPSC, n.d.).

b). Similarly, children have habit of climbing onto almirahs and TV trolleys them to reach their things. Such items can easily topple due to their low width and higher center of gravity. This butterfly effect kind of hazard has potential consequences, but is safety is simple and cheap: secure such furniture using safety wire with wall (U.S. Consumer Safety Product Commission, 2025).

It was also observed that NRCs, being a well-protected, gated community, give an added feeling of secured environment. However, accidents continue to occur within these secure premises, and their nature is largely similar to those observed in the wider civilian society. These real-life accidents remind us that a simple but often overlooked reality: God forbid, similar accidents can occur at any one's home irrespective of the rank or social status. The common belief held by people that "it won't happen here" is a dangerous assumption. Under broader ambit of proactive safety management, the following section outlines preventive measures (both at institutional and individual level) adopted within PN context to lead towards the critical role of personal responsibility in mitigating domestic risks.

4.3 Domestic Safety & Accident Prevention Measures Undertaken by PN

The measures being undertaken by PN are of both corrective and preventive nature so as to prevent the recurrence of similar incidents but also to anticipate/ timely

address potential hazards. These 'organizational actions' are explained below:

4.3.1. Already Implemented Measures

4.3.1.1. Fire Safety in Residential Areas

Fire safety in residential areas forms a key concern of PN, and hence requires a separate mention. So as to improve fire response in residential areas, PN Fire Brigade units have started to conduct fire exercises at NRCs on regular basis, albeit on a lesser frequency than being done in units/ establishments. Furthermore, PN has started undertaking awareness campaigns at NRCs and PN educational institutions to sensitize the families about basic firefighting and precautions, focusing on awareness as a preventive measure.

On the regulatory side, PBR-5014 was issued by NHQ (in 2018) to standardize the scale and specifications of firefighting equipment to be provided ashore in accordance with the national Fire Safety Provisions of 2016 (Pakistan Engineering Council, 2016). Two key areas merit mention:

a). First is the availability of fire points on residential floors. As per the regulation, fire points should be placed at 60 - 70 feet intervals on each floor. However, as of present, compliance varies across NRCs; from partial implementation to complete absence. In few locations, fire extinguishers are placed on floor instead of being wall mounted. Thus, in few cases, these were either blocked by household items or mishandled by children, reducing their operational utility. Wall-mounted installations may help ensure visibility and clear access in emergencies.

b). Secondly, PN is procuring 13,500 of Dry Chemical Powder (DCP) fire extinguishers, to be provided in kitchens at all NRCs. The availability of aforesaid extinguishers will significantly expand the firefighting coverage to household-level. Thus, as fire extinguishers will be made available in almost all households in near future; there is a need for awareness among all of families at NRC to use the fire extinguishers and most importantly kids not to play with it.

4.3.1.2. Miscellaneous Measures

Against the incidents of domestic nature, a wide range of safety measures have already been implemented within PN. These include:

a) Addressing the arising problems from old buildings etc.

b) Where needed, raising of grills and closing of gaps on balconies.

c) Displaying of emergency telephone numbers (safety lines) at prominent places in residential areas.

d) Dissemination of information regarding EOR/ incident for awareness of all

personnel.

4.3.2. 'Domestic Safety' in PN Safety Publications

Although practical measures are being undertaken, the topic of domestic safety is not specifically covered in PN Manual of Safety, PBR-138A (Directorate of Safety, NHQ, 2016). Although PN Safety Strategy (issued in June 2025) and PN HIRM manual do provide broad guidelines and are being implemented as such, a need is being felt to institutionalize domestic safety measures rather than relying on individual or unit-level initiatives. Incorporating the topic of domestic safety into PBR-138A along with instructions/ guidelines to individuals, may address the concern, ensuring consistency and continuity across residential settings of PN personnel.

4.4 Individual Responsibility & Attitude Towards Safety

4.4.1. Effectiveness of Organizational Measures

To gauge the efficacy of measures being implemented in NRC, a few observations were undertaken by author at an NRC in Karachi. Following was observed:
At an apartment building where fire poster was conspicuously displayed in parking area and emergency phone numbers visibly painted on all floors; the lady wives and children (10 - 16 years) were asked to tell the phone no of fire brigade. None could recall, admitting that they never paid attention to contents.

Similarly, at another high-rise apartment where CO_2 fire extinguishers were installed, some of the resident officers were surveyed if their lady wives were cognizant of the safety hazards associated with the aforesaid extinguishers. While majority of the officers themselves knew about the danger (of frostbite/ cold burns), they admitted that they had not ever informed their families. All households had fire extinguishers installed in the kitchen, yet none of officer (residing therein) had talked to their families about how to use them.

4.4.2. Individual's Responsibility Towards Domestic Safety

The above-stated questioning shows that, irrespective of how thorough organizational measures are, domestic safety will remain dependent on an individual's attitude towards safety at home. Even if PN undertakes organizational measures by installing safety equipment, it is the individual's own efforts (towards making their home safe or family aware of response actions) that will matter in ensuring safety during an emergency. In essence, at home, it is the individual, not the organization, that is the first line of defense to set, the safety rules, to enforce them, and the ones most affected by the outcome of any accident. Thus, it is the individual's own awareness and actions that is important: in our day-to-day lives, safety hazards are often observed, and accidents at work and at home are reported. Many of those who end up in accidents have attended safety sessions, seen warnings, or read safety instructions in the past. Yet accidents still happen, often the same ones, repeatedly.

Why? Because knowing "what safety is" and actually following safety are different things. There are two broad reasons for aforesaid (Directorate of Safety, NHQ, 2016 Article 0202):

a) Lack of Awareness. It means that although there is a hazard in front, we could not recognize the risk it carries (Uskun et al., 2022).

b) Complacency. Complacency refers to neglecting safety in spite of knowing the danger. Hence, people ignore small risks while thinking, "it won't happen to me", or "I have done this before without problems" while knowing the possible harm it can cause (Ludwig, 2018).

4.4.3. Preventive & Remedial Measures to Focus

Based on the analysis, following are the key areas that need to be stressed to PN personnel so as to make their homes safer:

4.4.3.1. Childproofing

In case, there is a child aged 6 months to 4 years at home, child proofing of home is required. The low-lying electrical outlets sockets are to be covered using socket cover or good quality tape as well as sharp corners of furniture. The thin and tall items like TV trolleys and cabinets are to be anchored so as prevent tipping over and injuring a child. The guardrails and grills are to be inspect and secured using net or cloth. In case, buckets are being for water storing, use of bucket covers is to be encouraged (CPSC, n.d.).

4.4.3.2. Storage of Flammable Items and Chemicals

Storage of flammable items, chemicals, poisons/ pesticides etc., at a safe place is important to prevent a big loss materializing from petty reason. Ideally, only the minimum required amount of chemicals should be stored at home in their original bottles with labels. Lids are required to kept tightly closed. These items are to be stored away from access to pets and children as well as protected from sources of heat, fire, and sunlight (Indiana Department of Environmental Management, 2025; Northern Ireland Government, n.d.; Rainbow Restorations, 2025).

4.4.3.3. Parental Guidance & Supervision

Parental guidance and supervision of kids is a very important step in domestic safety. Kids are to be watched and supervised especially when they are near fire or bucket of water and to be kept away from sharp tools and medicines.

4.4.3.4. Structural Hazards

Many of residential buildings in NRCs are decades old. Hence there is a need to keep guard on degrading structural parts and timely reporting to MES[7] for rectification

action. Open or damaged gutter covers must be identified and reported promptly. While organization takes action, it is individual's responsibility to sensitize family members of any potential dangers present for staying aware, exercising caution, and avoiding potential harm.

4.4.3.5. Electricity Precautions

Inculcating and continually reminding electrical safety at home is another important personal responsibility. Family members should be stressed for basic precautions: never touch electric switches with wet hands; always charge mobile phones, laptops, and tablets in well-ventilated areas; unplug heating appliances (i.e., irons, hair dryers, electric stoves, etc.) when not in use. In monsoon season, do not touch poles or electrical wires, as these pose a high potential for electrocution due wet conditions (K-Electric, 2025).

4.4.3.6. Fire Safety in Kitchen

The most fire prone area within household is kitchen and safety here requires conscious vigilance and informed behavior by all family members. Loose clothing (especially cuffs and dupattas, normally worn by ladies in Pakistan) need to be tucked in/ secured to avoid catching flames (Pakistan Safety Council, n.d.).

Family members should also be regularly reminded of fire safety measures, including how to extinguish oil fires, use of fire extinguishers, knowing emergency numbers, and the locations of gas and electricity mains.

4.4.3.7. Emergency Response

In case of emergency, it is important that emergency telephone numbers are known to family and have a quick access to these. As seen in past incidents, families were often unaware of emergency contact numbers when a fire broke out. To avoid delays during emergencies, National Helplines (like Rescue 1122) and PN emergency numbers (i.e., PN Fire Brigade, Officer of Day (OOD), and nearest Sickbay) should be clearly displayed near (landline) telephone sets and saved in mobile phones.

5. RECOMMENDATIONS

Domestic safety relies majorly on individuals own awareness to stay alert and proactively catering any potential hazards. While PN undertakes several measures to ensure safety of families, individual own efforts and awareness are also necessary. In view of aforesaid, a two-tier approach is recommended to strengthen domestic safety at both institutional and individual levels, as elaborated below:

5.1. Individual Level Measures

a. Family members must be regularly educated/ reminded on basic safety practices, including fire safety, electrical precautions, and emergency response.

b. Where households have young children, there is a need to conduct a safety survey of living space and take necessary steps to childproof areas, especially the kitchen, balconies, staircases, and low-lying electrical outlets.

c. Hazardous substances at home (such as flammable liquids, cleaning chemicals, and pesticides) should be stored in minimum required quantity, tightly sealed in their original containers that are clearly labelled, away from heat/ fire sources and away from access of children and pets.

d. Occupants must report MES-related hazards (e.g., exposed wiring, or malfunctioning equipment, etc.) to MES Complaint Cell for prompt rectification.

e. Displaying of emergency numbers including PN-specific contacts (i.e., Fire Brigade, OOD, and Sickbay) and national helplines (e.g., Rescue 1122) in vicinity of landline telephones and saving of these numbers in mobile phones.

5.2 Organizational Level Measures

There exists a need to bridge the existing gap between structured protocols of workplace safety at the organizational level and individual-led safety within domestic settings. Organizational level measures that can be undertaken by PN include:

a) The topic of domestic safety may be included in existing safety trainings of personnel. PN Personnel may be stressed of their individual responsibility for safety of their families and belongings at home through awareness, preparedness, and vigilance, besides workplace safety.

b) For institutionalizing the practices for domestic safety in PN:

(1) A dedicated chapter on ‘Domestic Safety’ may be developed through safety experts and incorporated into relevant PN safety publications.

(2) Safety awareness campaigning at NRC and PN Education Institutes may be centrally planned & monitored to promote standardized practices.

6. CONCLUSION

Domestic safety is inherently different from workplace safety in terms of environment, supervision, and responsibility. While there is a strong culture of workplace safety in PN, past studies suggest that individuals may not necessarily transfer the safety-conscious behaviors developed at workplace to their home environment without deliberate reinforcement. In view of the aforesaid and using ‘butterfly effect’ (or ‘small oversights, big consequences’) as a conceptual lens, this paper puts forward two main arguments: firstly, safety at home fundamentally relies on individual awareness coupled with proactive, continuous attention to arising hazardous situations that are implicit and benign but with severe consequences. Secondly, most domestic accidents can be prevented through simple, timely actions that stem from developing awareness and a culture of safety at home.

Although PN is taking (organizational) measures to enhance safety at homes in NRCs; however, just having rules, or disseminating of hazard/ accident information, or to making safety equipment available does not fully ensure domestic safety. The core challenge still remains: how can the organization extend the benefits of safety culture at workplace into the homes of its personnel? This paper argues that the aforesaid calls for more than just policy making or mere dissemination of information. It demands that a parallel sense of their personal responsibility in domestic spaces needs to be consciously inculcated amongst officers, CPOs/ sailors, and civilian personnel. Building a strong safety mindset amongst individuals that exhibits a constant vigilance and awareness at home along with care for one's own family and belongings, is therefore essential to bridge this critical gap.

7. LIMITATIONS & FUTURE RESEARCH

7.1 Limitations

This study uses the EOR records and contextual observations by author within PN complexes. This may not depict the full extent of domestic safety incidents due to underreporting of minor accidents, near-miss events, or incidents involving PN personnel residing in civilian areas. It also does not incorporate any primary data from effected families (interviews, direct behavioral observations, etc.). Thus, this research work may not offer an insight into individual perceptions, attitudes, and compliance with already intimated safety practices, that resulted into accident. Furthermore, variations (between different NRCs) in design of houses/ flats, family composition, and socioeconomic factors are not examined in depth, although these variables may influence domestic safety. As a qualitative and exploratory analysis, the research focuses on identifying patterns and vulnerabilities rather than establishing relationships or statistically testing the effectiveness of any specific intervention(s). Furthermore, any policy changes, procedural updates, or improvements implemented by PN/ associated departments after July 2025 are not captured.

Residences in cantonments are distinct from civil areas due presence of organizational oversight for implantation of instructions, security arrangements, and maintenance of infrastructure. Hence, the findings may hold relevance towards Pakistan Army or Air Force, they are not directly generalizable to civilian residential settings.

7.2 Future Research

Building on this research, future studies may be undertaken to test the effectiveness of organizational measures being undertaken by PN for domestic safety (safety instructions, awareness programs, and enforcement approaches, etc.) through detailed surveys and observational methods.

DISCLAIMER

The views and opinions expressed in this article are those of the authors alone and

do not necessarily reflect the official policies, positions, or views of PN or any affiliated institutions or departments.

COMPETING INTERESTS

This research was conducted independently by author, without any direction, sponsorship, or specific requirement from PN. No competing interests exist that could have influenced the study or its findings. The authors no conflicts of interest.

NOTES:

[1.] In PN, accidents and incidents are being recorded as Occurrence Reports. So, in this study, the word “occurrence” is used in place or accident/ incident.

[2.] Without agreement on what the term, “safety" means (whether it's the absence of accidents, the ability to manage risks, or something else); researchers may misunderstand each other and it becomes difficult to compare studies or develop common standards. This lack of clarity hinders both practical improvements and epistemic advancement (i.e., progress in shared understanding, conceptual development, and the overall growth of safety-related knowledge)

[3.] “Freedom from danger, risk and injury” is a very common definition of safety. Since military/ naval activities are inherently risky, the word “unacceptable” was added to risk by PN

[4.] Safety-II reframes safety as the ability of a system to succeed under varying conditions by learning from everyday performance and adaptability. Safety-III extends further, defining safety as the elimination of those outcomes that are deemed unacceptable by stakeholders through a systemic, resilience-focused strategy (Aven, 2022).

[5.] This example is based on an incident within PN narrated to author in 2007/8. While the specifics may vary, the pattern of such tragic outcomes stemming from seemingly benign household conditions is widely documented in the Pakistani context. For instance, see (Ahmed et al., 2004; Zia et al., 2012; Gulf Today, 2025).

[6.] WHO (2018) estimated approximately 424,000 deaths and 37 million injuries annually, mostly occurring in low-income countries.

[7.] PBR-138A. Article 0202.

[8.] Military Engineering Service (MES) is a governmental organization responsible for the planning, design, construction, and maintenance of infrastructure and engineering works for all three of the Pakistan Armed Forces, including buildings, roads, and utilities.

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