



(REVIEW ARTICLE)



Architectural perspectives of human trigger variables on user safety in public stadia situated in south-east and south-south zones of Nigeria

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Abstract

User safety is one of the major challenges in public stadia in South-East and South-South zones of Nigeria. Literature abounds with studies on crowd safety in stadia, but the impact of human triggers on user safety in public stadia situated in the study area has not been studied. Users in these stadia are exposed to safety risks which could be stimulated by human triggers. This paper focused on the phenomenon of triggers and aimed to systematically investigate potential triggers of stampede and resultant emotional reactions in crowded public stadia in the study area with a view to developing a framework for improved performance of the stadia. The objective of the study was to examine the extent human triggers in public stadia affect user safety in the South-East and South-South zones of Nigeria. The data were collected using survey instruments derived from direct operationalization of the Table of variable definition to ensure the reliability and validity of the study. The data was analysed using Statistical Packages for the Social Sciences (SPSS). The findings were that human triggers significantly impact on user safety in public stadia in the study area, while recommendations were that effort must be made by all stakeholders to minimize human triggers that promote frequency of movement difficulties in the stadia.

Keywords: Human Trigger Variables; User Safety; Public Stadia; Emotional Reactions.

1. Introduction

A trigger may be referred to as a stressor. Triggers are stimuli or events that happen around the individual, provoking particular emotional responses (Miskewicz, 2015). Two aspects to a psychological trigger are the stimuli and the response to the stimuli. Some triggers will evoke minor responses, while others stimulate powerful emotional reactions (Newman, Wallace, & Mcnelly, 1993). A trigger could be an event or situation that causes something to start (Cambridge Dictionary <https://dictionary.cambridge.org>). A trigger activates or sets off intense or unexpected response. Any sensory stimulus can be a potential trigger while in sociology a trigger is anything that causes a person to relieve a past trauma (Saripalli, and Pedersen 2022). Although trigger types include internal, external and sensory forms, maintenance triggers include breakdown, time-based, event-based, usage-based, and condition based (Lindner, 2008). Triggers could be smells, words, colours or stimulus to painful memory or physical sensation. In medicine triggers are specific events that start a process or cause a particular outcome. In science triggers could be an act or event which serve as a stimuli and begin a reaction in series of reactions (Stangor, 2014).

Triggers are stimuli, catalysts, energizers or events which give impetus to responses and outcomes (Merriam - Webster.com). A trigger affects emotional state significantly by provoking extreme distress or excitement. An individual that is triggered has a strong uncomfortable emotional reaction to a stimulus. When people are triggered they may panic, feel overwhelmed, cry, act out, withdraw or respond in a defensive manner. Psychological triggers encourage users to move closer to or further away from the stimuli (Huntington & Davis, 2022). Contributing in the discus, Jeffrey,

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(2016) suggested that human beings naturally imbibe the feelings of the people within their vicinity. Such people, called empathes, may have their emotions triggered by the emotions of others. This could be an issue within a crowded stadium scenario.

This study is part of a wider research on the impact of human triggers on user safety in public stadia situated in South-East and South zones of Nigeria. To underpin this research, the systems theory was adopted to be relevant in understanding the concept of user safety in public stadia. This theory was developed by Ludwig Von Bertalanffy in 1968. It focused on universally existing and accepted principles in application to generalized systems or their sub systems (Panarchy.org, 2016). Abraham and Berenbaum (2007) reported that certain emotions of shame, anger, and anxiety evoke various impulsive and compulsive behaviours. The ability to skillfully manage responses to triggers determines how able individuals manage their lives (Mansell, 2005). Triggers produce emotional reactions or neurological responses which may result in physical and psychological changes which may heighten behaviour of individuals. The interplay between the triggers of anxiety and user safety in stadia in South-East and South-South zones of Nigeria is a gap yet to be addressed in literature.

The purpose of the study is to systematically investigate potential triggers of stampede and resultant emotional reactions in crowded public stadia in the study area with a view to developing a framework for improved performance of the stadia. The objective of the study was to; *"examine the extent existing human triggers in public stadia affect user safety in the study area"*. The research question was *"to what extent do existing human triggers impact on user safety in public stadia in the study area?"*, while the null hypothesis was *"human triggers do not significantly impact on user safety in public stadia in the study area"*. The need for safe public stadia in Nigeria was identified in Idubor and Oisamaje 2013. Although the essence of user safety in stadia has been identified in literature, appropriate framework to guide proper design, legislation, and operations in South-East and South-South zones of Nigeria has not been established. The investigation of human triggers in the perspective of user safety in public stadia in the study area is critical in understanding their significant impact on user safety.

2. Methodology

The study was carried out in the public stadia situated in the South-East and South-South zones of Nigeria. This involved administration of questionnaire on the target population to obtain data. At the time of the survey there were 7 public stadia in the study area out of which 4 stadia were chosen through multi-stage random sampling. The respondents were stadium staff, and other users of the stadia.

Cochran formula for finite population was used to derive the sample size:

$$n = \frac{n_o}{1 + \frac{(n_o - 1)}{N}} \dots \dots \dots \text{Equation II (Kothari, 2004)}$$

Where: n_o is Cochran 's sample size recommendation

- N = population size
- n = new adjusted sample size

The sample size was substituted into the formula to obtain the population of staff and spectator respondents. The obtained figure was redistributed among the sampled stadia to obtain their proportional contribution to N above.

Fifteen (15) variables were deployed in the investigation as shown in Table 1: Twelve of the variables were ordinal, one was interval, while two were nominal.

The data were collected using survey instruments derived from direct operationalization of the Table of variable Definition. This ensured the reliability and validity of the study. Univariate analysis was done on all the variables to obtain respondents' statistics such as frequency distribution and measures of central tendency. Bivariate analysis was used to examine pair-wise relationships of how two variables affect each other. Multivariate analysis was used to investigate significant difference in the stadia as relates to the impact of human triggers on user safety.

Table 1 Definition of Variables

V/N	Description	Code	Measurement	Values	Categories
Human Trigger Variables					
V1	Attended safety training	AST	Ordinal	1-5	1-(least time = 0), 2-(2 times), 3-(3 times), 4-(more satisfied), 5-(most satisfied)
V2	Satisfaction with stadium clinic services	SSCS	Ordinal	1-5	1-(least satisfied), 2-(satisfied), 3-(neither), 4-(more satisfied), 5-(Most satisfied)
V3	Hours gates open before kick-off	HGBK	Interval	1-5	1-(0-hr), 2-(2-3hrs), 3-(4-5hrs), 4-(6-7hrs), 5-(>8hrs)
V4	Dilemma of event stoppage for Evacuation	DESE	Ordinal	1-5	1-(least often), 2-(often), 3-(neither), 4-(more often), 5-(most often)
V5	Upset because event had been sold out	UESO	Ordinal	1-5	1-(least often), 2-(often), 3-(neither), 4-(more often), 5-(most often)
V6	Video replay provoke user action	WVA	Nominal	1-2	1-(yes),2-(no)
V7	Ever jumped queue to gain quick access into arena	EJQ	Nominal	1-2	1-(yes),2-(No)
V8	Stadium Security act aggressively towards users	SSAU	Ordinal	1-5	1-(least often), 2-(often), 3-(neither), 4-(more often), 5-(most often)
V9	Users push others at stadium entrances	UPASE	Ordinal	1-5	1-(least frequent), 2-(frequent), 3-(neither), 4-(more frequent), 5-(most frequent)
V10	Staff loss of self-control	SLSC	Ordinal	1-5	1-(least frequent), 2-(frequent), 3-(neither), 4-(more frequent), 5-(most frequent)
V11	Frequency of Movement difficulties in stadium	FMDS	Ordinal	1-5	1-(least frequent), 2-(frequent), 3-(neither), 4-(more frequent), 5-(most frequent)
Safety Infrastructure Variables					
V12	Witnessed fainting spells in stadium	WFSS	Ordinal	1-5	1-(least frequent), 2-(frequent), 3-(Neither), 4-(more frequent), 5-(most frequent)
V13	Witnessed fainting spells in stadium	WFSS	Ordinal	1-5	1-(least frequent), 2-(frequent), 3-(Neither), 4-(more frequent), 5-(most frequent)
V14	Adequacy of space for queuing in ticket sales outlets	ASQTS	Ordinal	1-5	1-(least adequate space), 2-(adequate space) 3-(Neither), 4-(More adequate space), 5-(most adequate space)
V15	Comfortable stadium seat	CSS	Ordinal	1-5	1-(least comfortable), 2-(comfortable), 3-(Neither), 4-(More comfortable), 5-(most comfortable)

Source:(Nwanguma, 2020)

The research population in this study were all the seven public stadia located in the study area. (see Table 2). The stadia were Adokiye Amiesemaka Stadium, Port Harcourt, River State; Godswill Akpabio International Stadium, Uyo, Akwa-Ibom State; U. J. Esuene Stadium, Calabar, Cross River State; Dan Anyiam Stadium, Owerri, Imo State; Nnamdi Azikiwe International Stadium, Enugu, Enugu State; Samuel Ogbemudia Stadium, Benin- City, Edo State; and Yakubu Gowon

Stadium (formerly Liberation Stadium), Port Harcourt, River State. Table 2 is the list of public stadia situated in the study area constituted the sampling frame:

Table 2 List of Public Stadia in South-East and South-South geo-political zones of Nigeria by on ownership

S/N	State	Available Public Stadia	Capacity	Year Commissioning	of
1	Abia	None			
2	Anambra	None			
3	Akwa Ibom	Godswill Akpabio International Stadium Uyo	30,000	2014	
4	Bayelsa	None			
5	Cross River	U.J. Esuene Stadium, Calabar	30,000	1977	
6	Delta	None			
7	Ebonyi	None			
8	Edo	Samuel Ogbemudia Stadium, Benin City	30,000	1983	
9	Enugu	Nnamdi Azikiwe International Stadium, Enugu	22,000	1959	
10	Imo	Dan Anyiam Stadium Owerri	10,000	1998	
11	River	Adokiye Amasiemaka Stadium, Port-Harcourt Yakubu Gowon Stadium (formerly Liberation Stadium), Port Harcourt	38,000 25,000	2015 2001	

Source:(Nwanguma, 2020)

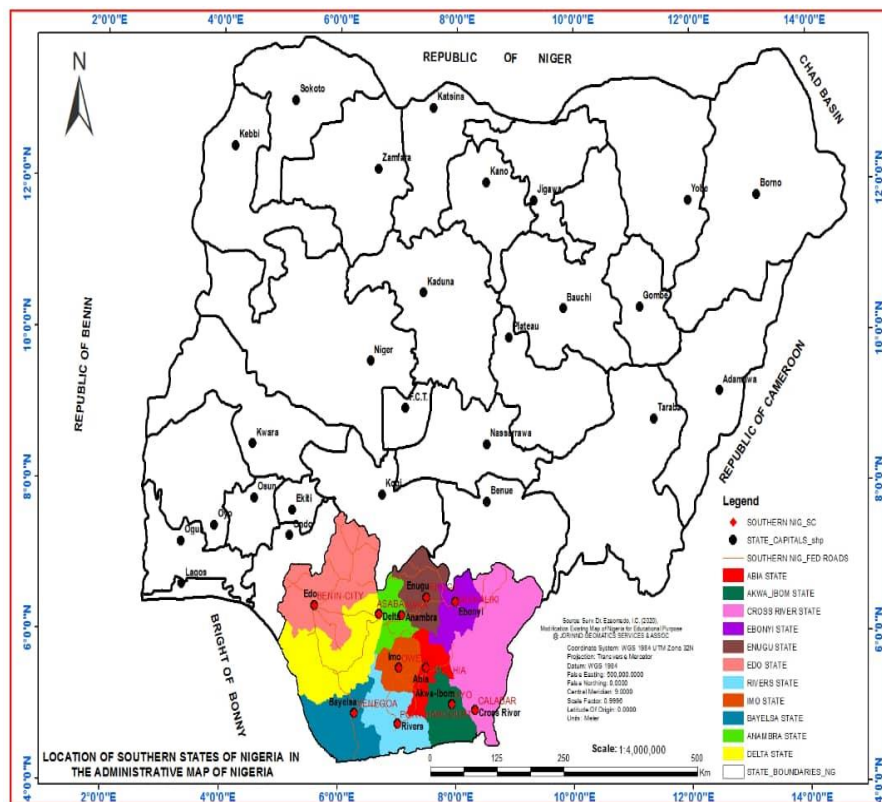


Figure 1 Location of South-East and South-South geo-political zones of Nigeria
Source: Jorinno Survey Services & Associates, (2018)

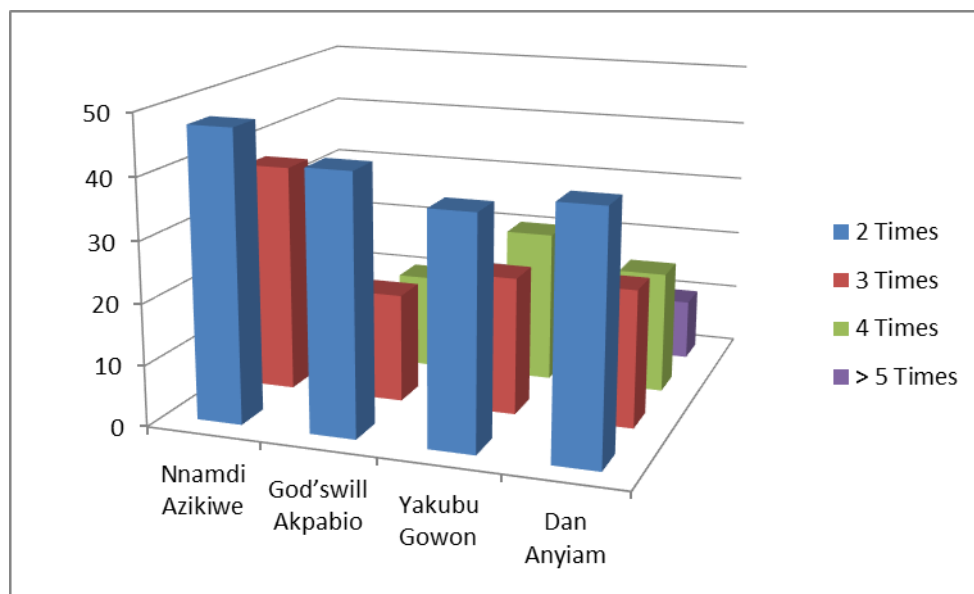
The study area is South-East and South-South zones of Nigeria, two of six geo-political zones in Nigeria created by the late Military Head of State, General Sanni Abacha in 1995 (Gaadi, 2014). Nigeria is a West African country situated approximately between longitudes 3 degrees and 14 degrees East of the Greenwich meridian and latitudes 4 degrees and 14 degrees North of the equator. The South-East states are Abia, Anambra, Ebonyi, Enugu, and Imo, while Akwa-Ibom, Bayelsa, cross-River, Delta, Edo, and River States constitute the South-South States (Nwozor, 2014). These states have a total of seven (7) public stadia; one federally funded Nnamdi Azikiwe International Stadium, Enugu, while six others are state funded. The public stadia have been venues for recreation and competitive sports and athletic events, political rallies, and religions crusades and live concerts which are usually attended by large crowds.

3. Results and Discussion

The frequency distribution for the variables shown in Table1 was done to understand the behaviour and characteristics as depicted by the respondents. Also, Correlational analysis was done using Pearson Product Moment Correlation analysis tool to test the significant relationship between the variables.

3.1. The Extent Existing Human Triggers Affect User Safety in the Stadia Attended safety training AST(Variable 1)

The data showed that 50.0% of the respondents from Nnamdi Azikiwe stadium indicated (2times), 39.5% (3 times), 5.3% (4 times), while 5.2% indicated (> 5times). Data collected from God'swill Akpabio stadium showed that 45.2% of the respondents indicated (2times), 19.0%(3 times), 16.7% (4 times), while 19.0% indicated (> 5times). Data gathered from Yakubu Gowon stadium showed that 38.5% of the respondents indicated (2times), 23.1% (3 times), 25.6% (4 times), while 12.8% indicated (> 5times). The data collected from Dan Anyiam stadium showed that 43.2% of the respondents indicated (2times), 24.3% (3 times), 21.6% (4 times), while 10.8% indicated (> 5times). This is depicted in Figure 2.



Source: Fieldwork (2019)

Figure 2 Attended safety training

3.2. Satisfaction with stadium clinic servicesSSCS (Variable 2)

The data collected showed that 60.5% of the respondents from Nnamdi Azikiwe stadium indicated (least satisfied), 26.3% (satisfied), while 13.2% indicated (more satisfied). Data gathered from God'swill Akpabio stadium showed that 50.0% of the respondents indicated (least satisfied), 26.2% (satisfied), while 23.8% indicated (more satisfied). Data collected from Yakubu Gowon stadium showed that 56.4% of the respondents indicated (least satisfied), 35.9% (satisfied), while 7.7% indicated (more satisfied). The data collected from Dan Anyiam stadium showed that 43.2% of the respondents indicated (least satisfied), 35.2% (satisfied), while 21.6% indicated (more satisfied). This is delineated in Table 4.

Table 3 Area-wise data on V2 - Satisfaction with stadium clinic services

Value Label	Nnamdi Stadium		Azikiwe Stadium		God'swill Stadium		Akpabio Stadium		YakubuGowon Stadium		Dan Stadium		Anyiam Stadium	
	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %
Least satisfied	60.5	100.0	50.0	100.0	56.4	100.0	43.2	100.0						
satisfied	26.3		26.2		35.9		35.2							
Neither														
More satisfied	13.2		23.8		7.7		21.6							
Most satisfied														
Total	100.0		100.0		100.0		100.0					100.0		

Source:(Nwanguma, 2020)

3.3. Hours gate open before kick-off HGBK (Variable 3)

The data showed that 78.9% of the respondents from Nnamdi Azikiwe stadium indicated (0-1hr), while 21.1% indicated (2-3hrs). Data gathered from God'swill Akpabio stadium showed that 83.3% of the respondents indicated (0-1hr), 11.9% (2-3hrs), while 4.8% indicated (4-5hrs). The data collected from Yakubu Gowon stadium showed that 84.6% of the respondents indicated (0-1hr), 10.3% (2-3hrs), while 5.1% indicated (4-5hrs). The data collected from Dan Anyiam stadium showed that 73.0% indicated (0-1hr), 18.9% (2-3hrs), while 8.1% indicated (4-5hrs). This is depicted in Table 4.

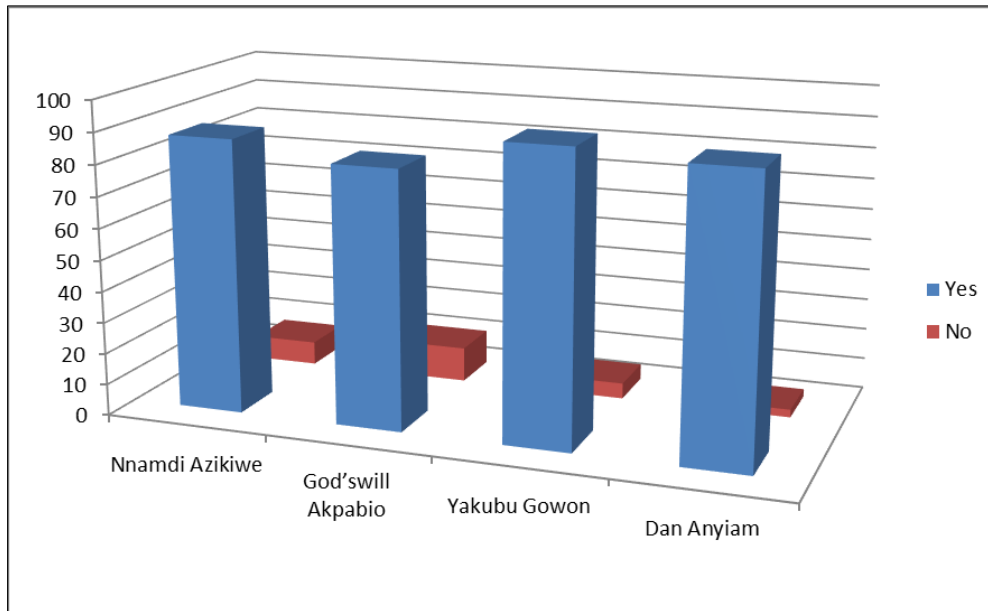
Table 4 Area-wise data on V3 - Hours gate open before kick off

Value Label	Nnamdi Stadium		Azikiwe Stadium		God'swill Stadium		Akpabio Stadium		Yakubu Stadium		Gowon Stadium		Dan Stadium		Anyiam Stadium	
	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %	%	Cum %
0-1hrs	78.9	100.0	83.3	100.0	84.6	100.0	73.0	100.0								
2-3hrs	21.1		11.9		10.3		18.9									
4-5hrs			4.8		5.1		8.1									
6-7hrs																
>8hrs																
Total	100.0		100.0		100.0		100.0					100.0				

Source:(Nwanguma, 2020)

3.4. Dilemma of event stoppage for evacuation DESE (Variable 4)

The data showed that 92.1% of the respondents from Nnamdi Azikiwe stadium indicated (Yes), while 7.9% indicated (No). Data gathered from God'swill Akpabio stadium showed that 88.1% of the respondents indicated (Yes), while 11.9% indicated (No). Data collected from Yakubu Gowon stadium showed that 94.9% of the respondents indicated (Yes), while 5.1% indicated (No). The data collected from Dan Anyiam Stadium showed that 97.3% of the respondents indicated (Yes), while 2.7% indicated (No). This is delineated in Figure 3.



Source: Fieldwork (2019)

Figure 3 Dilemma of event stoppage for evacuation

3.5. Upset because event had sold out UESO (Variable 5)

The data collected showed that 23.6% of the respondents from Nnamdi Azikiwe stadium indicated (*least often*), 50.9% (*often*), while 25.5% indicated (*most often*). Data gathered from God'swill Akpabio stadium showed that 32.8% of the respondents indicated (*least often*), 37.5% (*often*), while 29.7% indicated (*most often*). Data collected from Yakubu Gowon stadium showed that 18.9% indicated (*least often*), 41.5% (*often*), while 39.6% indicated (*more often*). The data collected from Dan Anyiam stadium showed that 20.0% indicated (*least often*), 43.3% (*often*), 36.7% (*most often*). This is delineated in Table 5.

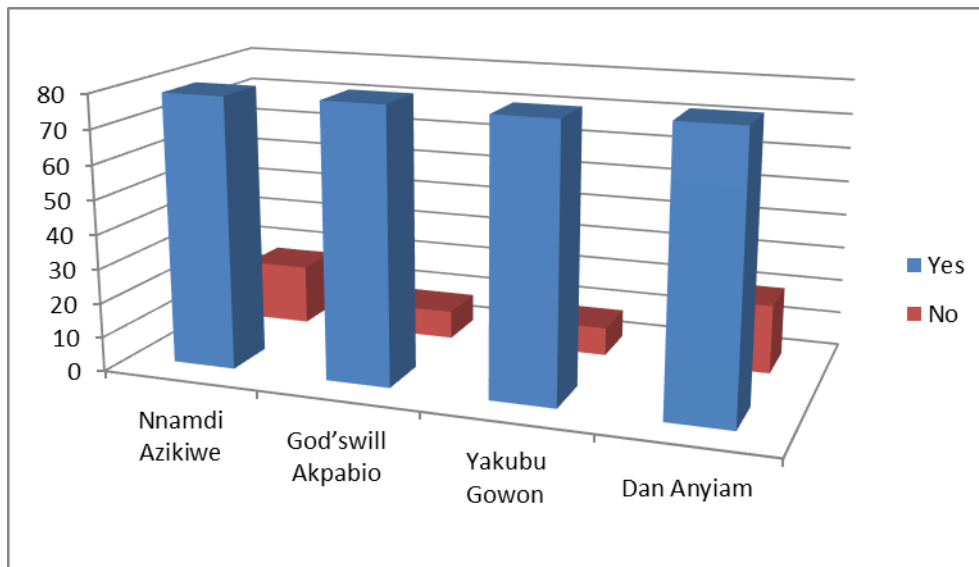
Table 5 Area-wise data on V5 - Upset because event had sold out

Value Label	Nnamdi Azikiwe Stadium		God'swill Akpabio Stadium		Yakubu Gowon Stadium		Dan Anyiam Stadium	
	%	Cum %	%	Cum %	%	Cum %	%	Cum %
Least often	23.6	100.0	32.8	100.0	18.9	100.0	20.0	100.0
often	50.9		37.5		41.5		43.3	
Neither								
More often								
Most often	25.5		29.7		39.6		36.7	
Total	100.0		100.0		100.0		100.0	

Source:(Nwanguma, 2020)

3.6. Video replay provoked user action WVA (Variable 6)

The data collected showed that 81.8% of the respondents from Nnamdi Azikiwe stadium indicated (*Yes*), while 18.2% indicated (*No*). Data gathered from God'swill Akpabio stadium showed that 90.6% of the respondents indicated (*Yes*), while 9.4% indicated (*No*). Data collected from Yakubu Gowon stadium showed that 90.6% of the respondents indicated (*Yes*) while 9.4% indicated (*No*). The data collected from Dan Anyiam Stadium showed that 80.0% respondents indicated (*Yes*), while 20.0% indicated (*No*). This is represented in Figure 4.

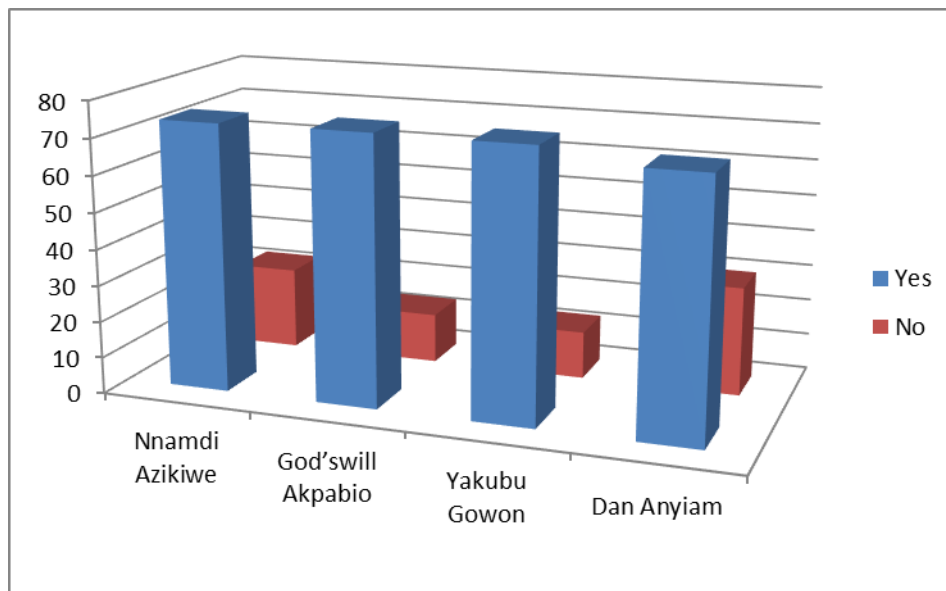


Source: Fieldwork (2019)

Figure 4 Video replay provoked user action

3.7. Ever jumped queue to gain quick access into arena *EJQ* (Variable 7)

The data showed that 76.4% of the respondents from Nnamdi Azikiwe stadium indicated (*Yes*), while 23.6% indicated (*No*). Data gathered from God'swill Akpabio stadium showed that 84.4% of the respondents indicated (*Yes*), while 15.1% indicated (*No*). Data gathered from Yakubu Gowon stadium showed that 84.9% indicated (*Yes*), while 15.1% indicated (*No*). The data collected from Dan Anyiam Stadium showed that 70.0% respondents indicated (*Yes*), while 30.0% indicated (*No*). This is depicted in Figure 5



Source: Fieldwork (2019)

Figure 5 Ever jumped queue to gain quick access into arena

3.8. Stadium security act aggressively towards users *SSAU* (Variable 8)

The data collected showed that 43.6% of respondents from Nnamdi Azikiwe stadium indicated (*least often*), 27.3% (*often*), 3.6% (*neither*), while 25.5% indicated (*more often*). Data gathered from God'swill Akpabio stadium showed that 35.9% of the respondents indicated (*least often*), 34.4% (*often*), 1.6% (*neither*), while 28.1% indicated (*more often*). Data collected from Yakubu Gowon stadium showed that 32.1% of the respondents indicated (*least often*), 49.1% (*often*), 3.8% (*neither*), while 15.1% indicated (*more often*). The data gathered from Dan Anyiam stadium showed that

33.3% of the respondents indicated "least often", 40.0% (often), 10.0% (neither), 16.7% (more often). This is depicted in Table 6.

Table 6 Area-wise data on V8 - Stadium security act aggressively towards users

Value Label	Nnamdi Azikiwe Stadium		God'swill Akpabio Stadium		Yakubu Gowon Stadium		Dan Anyiam Stadium	
	%	Cum %	%	Cum %	%	Cum %	%	Cum %
Least often	43.6	100.0	35.9	100.0	32.1	100.0	33.3	100.0
often	27.3		34.4		49.1		40.0	
Neither	3.6		1.6		3.8		10.0	
More often	25.2		28.1		15.1		16.7	
Most often								
Total	100.0		100.0		100.0		100.0	

Source:(Nwanguma, 2020)

3.9. Users push others at stadium entrances UPASE (Variable 9)

The data collected from Nnamdi Azikiwe stadium showed that 43.6% of respondents indicated "least frequent", 54.5% (frequent), while 1.8% indicated (more frequent). Data gathered from God'swill Akpabio stadium showed that 42.2% of the respondents indicated "least frequent", 37.5% (frequent), while 20.3% indicated (more frequent). Data collected from Yakubu Gowon stadium showed that 39.6% of the respondents indicated "least frequent", 56.6% (frequent), while 3.8% indicated (more frequent). The data collected from Dan Anyiam stadium showed that 36.7% of the respondents indicated "least frequent", 56.7% (frequent), 6.6% (more frequent). This is depicted in Table 7.

Table 7Area-wise data on V9 - Users push others at stadium entrances

Value Label	Nnamdi Azikiwe Stadium		God'swill Akpabio Stadium		Yakubu Gowon Stadium		Dan Anyiam Stadium	
	%	Cum %	%	Cum %	%	Cum %	%	Cum %
Least frequent	43.6	100.0	42.2	100.0	39.6	100.0	36.7	100.0
frequent	54.5		37.5		56.6		56.7	
Neither								
More frequent	1.8		20.3		3.8		6.6	
Most frequent								
Total	100.0		100.0		100.0		100.0	

Source:(Nwanguma, 2020)

3.10. Aggregated data on the variables

Table 8 Aggregated data on use of adhoc staff to operate stadium

Value Label	%	Cum %
Least often	55.1	55.1
Often	25.6	80.8
More often	19.2	100.0
Total	100.0	

Source:(Nwanguma, 2020)

3.10.1. Attended safety training AST (Variable 1)

The outcome showed that 44.2% of the respondents indicated (2 times), 26.3% (3 times), 17.3% (4 times), while 12.2% indicated (>5 times). This is depicted in Table 9.

Table 9 Aggregated data on attended safety training

Value Label	%	Cum %
2 times	44.2	44.2
3 times	26.3	70.5
4 times	17.3	87.8
> 5 times	12.2	87.8
Total	100.0	

Source:(Nwanguma, 2020)

3.10.2. Satisfaction with stadium clinic services SSCS (Variable 2)

The outcome depicted that 52.6% of the respondents indicated "least satisfied", 30.8% (satisfied), while 16.7% indicated (more satisfied). This is depicted in Table 10

Table 10 Aggregated data on satisfaction with stadium clinic services

Value Label	%	Cum %
Least satisfied	52.6	52.6
Satisfied	30.8	83.3
More satisfied	16.7	100.0
Total	100.0	

Source:(Nwanguma, 2020)

3.10.3. Hours gate open before kick-off HGBK (Variable 3)

The results showed that 80.1% of the respondents indicated (0-1hr), while 15.4% indicated (2-3hrs), while 4.5% indicated (4-5hrs). This is delineated in Table 11.

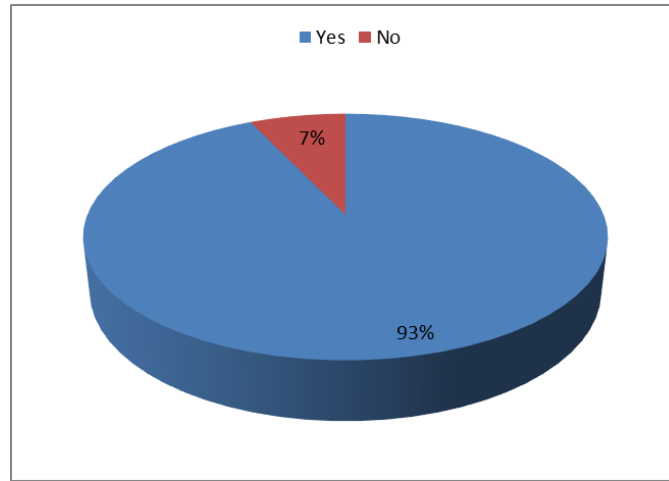
Table 11 Aggregated data on hours gate open before kick-off

Value Label	%	Cum %
0-1hr	80.1	80.1
2-3hrs	15.4	95.5
4-5	4.5	100.0
Total	100.0	

Source:(Nwanguma, 2020)

3.10.4. Dilemma of event stoppage for evacuation DESE (Variable 4)

The results showed that 92.9% of the respondents indicated "Yes", while 7.1% indicated "No" This is delineated in Figure 6



Source: Fieldwork (2019)

Figure 6 Aggregate data on dilemma of event stoppage for evacuation

3.10.5. Upset because event had sold out UESO (Variable 5)

The outcome depicted that 24.8% of the respondents indicated "least often", 43.1% (often), while 32.2% indicated (most often). This is delineated in Table 12

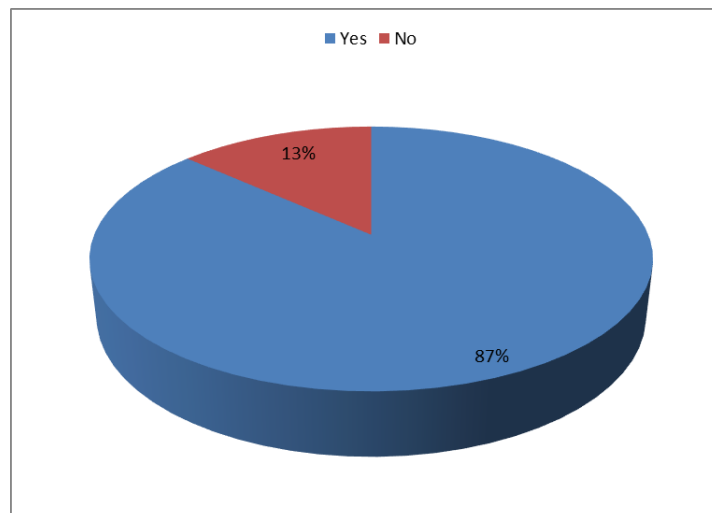
Table 12 Aggregated data on upset because event had sold out

Value Label	%	Cum %
Least often	24.8	24.8
Often	43.1	67.8
Mostoften	32.2	100.0
Total	100.0	

Source:(Nwanguma, 2020)

3.10.6. Video replay provoked user action WVA (Variable 6)

The results showed that 86.6% of the respondents indicated "Yes", while 13.4% indicated "No". This is delineated in Figure 7.

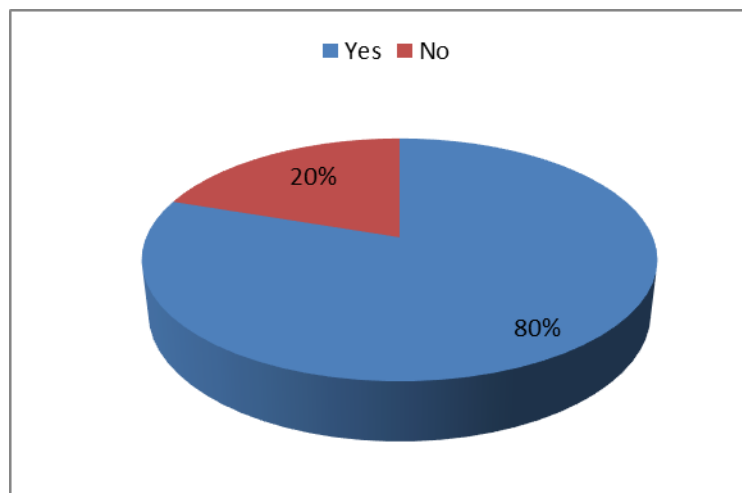


Source: Fieldwork (2019)

Figure 7 Aggregate data on video replay provoked user action

3.10.7. Ever jumped queue to gain quick access into arena EJQ (Variable 7)

The results showed that 80.2% of the respondents indicated "Yes", while 19.8% indicated "No". This is depicted in Figure 8.



Source: Fieldwork (2019)

Figure 8 Aggregate data on ever jumped queue to gain quick access into arena

3.10.8. Stadium security act aggressively towards users SSAU (Variable 8)

The results showed that 36.6% of the respondents indicated (Least often), 37.1% (Often), 4.0% (Neither), 22.3% (Most often). This is represented in Table 13.

Table 13 Aggregated data on stadium security act aggressively towards users

Value Label	%	Cum %
Least often	36.6	36.6
Often	37.1	73.8
Neither	4.0	77.7
Most often	22.3	100.0
Total	100.0	

Source:(Nwanguma, 2020)

3.10.9. Users push others at stadium entrance UPASE (Variable 9)

The results showed that 41.1% of the respondents indicated (Least frequent), 50.0% (frequent), 8.9% (More frequent). This is depicted in Table 14.

Table 14 Aggregated data on users push others at stadium entrance

Value Label	%	Cum %
Least frequent	41.1	41.1
Frequent	50.0	91.1
More frequent	8.9	100.0
Total	100.0	

Source:(Nwanguma, 2020)

3.10.10. Staff loss of self-control SLSC (Variable 10)

The outcome depicted that 55.4% of the respondents indicated (*Least frequent*), 29.7% (*frequent*), while 14.9% indicated (*More frequent*) This is depicted in Table 15.

Table 15 Aggregated data on staff loss of self-control

Value Label	%	Cum %
Least frequent	55.4	55.4
Frequent	29.7	85.1
More frequent	14.9	100.0
Total	100.0	

Source:(Nwanguma, 2020)

3.10.11. Frequency of movement difficulties in stadium FMDS (Variable 11)

The outcome that 52.0%% of the respondents indicated (*Least frequent*), 29.2% (*frequent*), 9.4% (*Neither*), while 9.4% indicated (*More frequent*). This is depicted in Table 16.

Table 16 Aggregated data on frequency of movement difficulties in stadium

Value Label	%	Cum %
Least frequent	52.0	52.0
Frequent	29.2	81.2
Neither	9.4	90.6
More frequent	9.4	100.0
Total	100.0	

Source:(Nwanguma, 2020)

3.11. Test of Hypothesis

3.11.1. The relationship between DESE and WFSS

Table 17 Pearson Product Moment correlation analysis of relationship between DESE and WFSS

		Dilemma of event stoppage for evacuation	Witnessed fainting spells in stadium
Dilemma of event stoppage for evacuation	Pearson Correlation	1	0.975
	Sig. (2-tailed)		0.025
	N	202	202
Witnessed fainting spells in stadium	Pearson Correlation	0.975	1
	Sig. (2-tailed)	0.025	
	N	202	202

Source:(Nwanguma, 2020)

A null hypothesis was proposed which stated that "*human triggers do not significantly impact on user safety in public stadia in the study area*". Two representative variables chosen for human triggers and user safety were "*dilemma of event stoppage for evacuation*" (*DESE*) and "*witnessed fainting spells in stadium*" (*WFSS*). The two variables in focus were ordinal variables, hence Pearson Product Moment Correlation analysis tool was used to examine the nature of the relationship. The results of the analysis tests table showed the value of the test statistic is 0.975 with probability value (p-value) of 0.025. Therefore the null hypothesis was rejected and the alternative hypothesis accepted. The alternative

states that "*human triggers significantly impact on user safety in public stadia in the study area*". This is backed in related literature where human trigger variables were significantly correlated with user safety in crowd events (Filingeri and Haslam, 2018; Ioannou, 2017; Nacos, 2010; Berlonghi, 1996; Bellet et al, 2018). The results are shown in Table 17.

Recommendations

It is therefore recommended that Government, professionals, and operators of public stadia should ensure that factors that promote frequency of movement difficulties in the stadia are minimized thus: Stadia gates should open a minimum of 5 hours before kick-off; warning signs should clearly show exits and entrances into the stadia; supply of electricity should be reinforced by alternative sources of power supply in the stadia; provide adequate queuing spaces in the ticket purchase locations; provide adequate space in the dispersal areas situated after the access control device; video replays that provoke user action must be avoided by stadia media crew. Adoption and implementation of these recommendations would meaningfully mitigate the impact of human triggers on user safety in the stadia and also improve the performance of the stadia.

4. Conclusion

The study investigated the importance of human trigger variables on user safety in public stadia situated in South-East and South-South zones of Nigeria. Resulting from the theoretical framework in the context of this study, conditions impacting on user safety in public stadia located in the study area are seen as a system made of six sub-systems, including: *Physical conditions of the stadia; natural conditions; socio-economic characteristics in the stadia; and existing human triggers in the stadia*. The interaction of these four sub-systems in prescribed values would produce the expected results of user safety. A breakdown of interaction of components of the sub-systems would lower the rating of the stadia in terms of user safety. The study drew objectives from these sub-systems and tested hypotheses under them.

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Authors short Biography



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