Original Article

Sanitary Conditions and Inmates' Knowledge and Attitude towards Hygiene Practices in a Maximum-Security Prison in Oyo State, Southwest Nigeria

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ABSTRACT

Context: The study was conducted in a maximum-security prison in southwest Nigeria, where inmates were held in lawful custody by a court of competent jurisdiction. The inmates are vulnerable, and their health is conditioned not only on their nutrition and health-care services but also on available water and sanitation services, personal and collective hygiene behaviour, within the prison environment.
Aim: The study assessed the living and sanitary conditions and hygiene practices of inmates in a maximum-security prison in Nigeria.
Settings and Design: The study was descriptive, cross-sectional in design and elicited information on knowledge, attitude and hygiene practice of consented prison inmates.
Methods: The questionnaire response was 94.8% and was identified through a multistage sampling technique and inmates were stratified by detention status with the minimum sample allocated by the proportional to size method. Systematic sampling was used for serial recruitment without replacement. The data collection tool was a validated, semi-structured, interviewer-administered questionnaire.
Statistical Analysis Used: Knowledge and attitudes were measured on a 24- and 55-point scales and rated as poor (≤11) and good (>11); negative (≤33) and positive (>33), respectively. Summary data were presented by descriptive, Chi-square and logistic regression at $P < 0.05$.
Results: Inmates mean age was 31.6 ± 8.2 years and mostly, males (98.3%) with 47.2% and 50.8% respectively married and completed secondary education. The main water source to inmates was hand-dug wells, while all-male conveniences were dirty. The major illnesses were malaria, ringworm and diarrhoea. In addition, sanitary knowledge was a significant predictor of attitude towards hygiene practices (OR: 0.52, 95% CI: 0.298-0.905).
Conclusions: The good knowledge and positive attitudes of inmates contrast poor sanitary conditions, perhaps due to poor sanitation and hygiene infrastructure and overcrowding conditions.

Key words: Hygiene practices, maximum-security prison, overcrowding, prison inmates, sanitary conditions

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INTRODUCTION

The sanitary conditions in prisons are poor and inhuman in many developing countries; a condition that has been associated with physical and psychological violence, diseases, deaths and humiliations.[1] In the West African sub-region, particularly in Nigeria, prisons are overcrowded, unhealthy and life-threatening.[2] Moreover, the facilities in prisons are in most cases in a state of disrepair, providing poor sanitary conditions and in urgent need of renovations.[3] Routledge and Francis[4] reported that the conditions in which prison inmates live is degrading and differ slightly when compared with those reported by Howard, 200 years ago. Globally, 1.6 million deaths are caused by lack of access to and/or inadequate water supply, sanitation and hygiene services.[5,6]

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In Nigeria, the number of prison facilities was between 228 and 239 over the period: 2007–2011, while the prison population increased from 39,691 in 2007 to 75,261 in 2010 and declined to 49,451 in 2011.[7] There is poor documentation of the enabling conditions in Nigerian prisons, a situation worsened by poor monitoring and inadequate funding to maintain infrastructures meant to reform inmates. In addition, the primary causes of morbidity and mortality among inmates in Nigeria include malnutrition, insanitary living conditions, exacerbated by overcrowding.[8] The dimensions of sanitary conditions vary from prison to prison, based on when constructed, its category, number of units, lock-up capacity, funds allocated and managed. Furthermore, there is a lack of inventory of water, sanitation and hygiene appurtenances and their functionality status in Nigerian prisons, which should determine strategic upgrading, within available resources in Nigeria. Therefore, this study provided a snapshot of the sanitary conditions and the perception of inmates towards hygiene practices in a Nigerian maximum security prison.

METHODS

Description of the study location

The maximum-security prison was located in Ibadan North-East Local Government Area (LGA) in Nigeria [Figure 1]. Ibadan is the capital of Oyo State and situated in southwest Nigeria; at about 128 km Northeast of Lagos and 530 km, Southwest of Abuja, the federal capital. Ibadan metropolis has 11 LGAs, comprised of five urban and six rural LGAs, with a mix of urban, semi-urban and rural communities.[9] The major ethnicity in Ibadan is Yoruba. The city continues to swell by rural-urban migration and has about 3,800,000 people.[10]

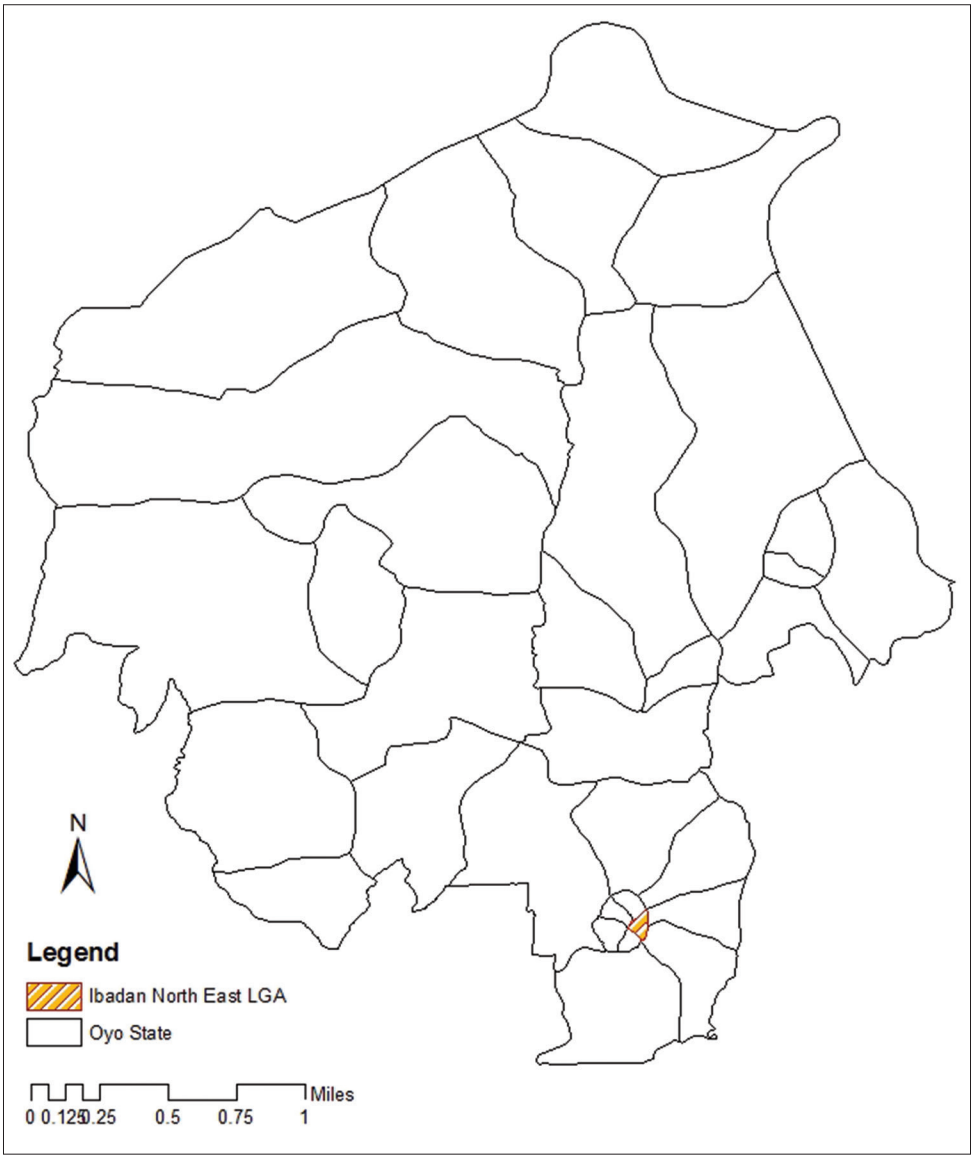

Figure 1: Map of the study area

The prison studied is the largest in Oyo State and one of over 200 prisons in Nigeria.[7] It accommodates male and female convicted and awaiting trial inmates, with a built-up capacity of 294 inmates when commissioned in 1990 but accommodated 723 inmates (716 males and 7 females) when studied.

Study design

The study design was descriptive, cross-sectional.

Sample size determination

The sample size was calculated using Fisher's formula.[11]

$$\text{Sample size } (n) = \frac{Z^2\ PQ}{d^2}$$

Where n = minimum sample size

Z = Standard normal deviation of 1.96 at 95% confidence interval (CI).

P = Proportions among inmates expected to exhibit poor sanitary hygiene was not known and assumed as 50% in the study.

Q = [1-p],

d = degree of accuracy.

n = 422, with 10% added for precision.

Sampling technique

The study purposively selected agodi prison with respondents identified through a two-stage sampling technique. The inmates were divided into either awaiting trial or convicted categories while proportional allocation to size method was used to appropriate the minimum sample. Furthermore, serial recruitment of respondents was applied after the prison units were identified by systematic sampling technique. Recruited respondents that declined assent were not replaced. Data were collected by a validated interviewer-administered, semi-structured questionnaire, in addition to the observational checklist that assessed sanitary conditions.

Inclusion and exclusion criteria

The study population is a vulnerable and high-risk group, and only those that consented in writing were studied. Besides, the research assistants interacted with the prison inmates in the dormitory to guarantee the confidentiality of respondents. However, those that were sick and on assignment outside the prison at the time of the survey were excluded.

Data collection and analysis

The data collection questionnaire was translated and back-translated into the Yoruba language. The data collected included socio-demographic attributes of respondents, knowledge on sanitation, handwashing behaviour, attitude towards hygiene practices and common health complaints. The maximum built capacity of the prison was compared with the current lock-up capacity. The questionnaire response rate was 94.8%.

The data were analysed by IBM-Statistical Package for Social Sciences for Windows, version 20.0 (Chicago, Illinois, USA). Continuous variables were summarised by means and standard deviation, while categorical findings were summarised by proportions and percentages in summary tables and charts. The association between socio-demographic characteristics and related variables were determined by Chi-square (χ^2) and logistic regression statistics.

Respondent's knowledge of sanitation was measured on a 24-point scale and categorised into poor ≤11 and good >11. Attitude to hygiene behaviour was scored on a 55-point scale and rated as negative ≤33 and positive >33. The variables with a $P \leq 0.25$ in χ^2 results were included in the logistic regression model. The dependent variable was respondent's attitude towards hygiene practices presented as a binary outcome, coded '0' for negative attitude and '1' for those with a positive attitude towards hygiene practices.

Ethics and consent to participate

Ethical permission was obtained from the UI/UCH Ethical Review Board (UI/EC/11/0232). All the prison inmates were briefed on the purpose of the study before their enrolment while there was no penalty for those who declined participation. The respondents provided written consent before their participation, and personal identifiers were removed in the summary data to guarantee confidentiality.

RESULTS

Table I reveals that most respondents (98.3%) were male, and the mean age was 31.6 ± 8.1 years [Figure 2]. In addition, more than two-fifths (47.2%) of respondents were married while over half (50.8%) had secondary education. Furthermore, 16.3% of respondents were unemployed before being imprisoned while the mean days spent in the prison by inmates was 729.2 ± 715.4 days, with 61.8% having spent more than 1 year in custody. Also, over 125 inmates live in an overcrowded accommodation of 4.7 × 3.4 m^2 dormitory and a unit, the cell size of 1.3 × 1.5 m^2.

Knowledge of the sanitary conditions in the study area

On knowledge, a majority of respondents (57.7%) knew that poor sanitation could not cause any disease in contrast to 84.0%) that knew that frequent maintenance of sanitation

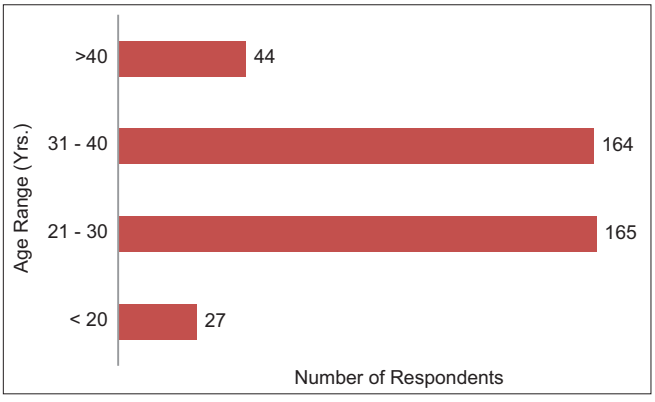

Figure 2: Age distribution of the respondents

Table I: Sociodemographic characteristics of respondents

Variables (*n*=400)	*n* (%)
Sex	
Male	393 (98.3)
Female	7 (1.7)
Age (years)	
≤20	27 (6.8)
21-30	165 (41.3)
31-40	164 (41.0)
41+	44 (11.0)
Religion	
Christianity	312 (78.0)
Islam	81 (20.3)
Traditional	5 (1.3)
Others**	2 (0.5)
Ethnicity	
Yoruba	265 (66.3)
Hausa	21 (5.3)
Ibo	86 (21.5)
Others*	28 (7.0)
Marital status	
Single	211 (52.8)
Cohabiting	13 (3.3)
Married	137 (34.3)
Divorced/widowed	9 (2.3)
Separated	30 (7.5)
Past occupation	
Civil servant[#]	77 (19.3)
Business[†]	134 (33.5)
Student	20 (26.0)
Artisan[§]	104 (5.0)
Unemployed/no work	65 (16.3)
Educational level	
No formal education	29 (7.3)
Primary	56 (14.0)
Secondary	203 (50.8)
Tertiary[§§]	113 (28.0)

*Constituted Edo and Delta, **Involved Pagan and Atheist, [§]Electricians, shoemakers/menders, mechanics, glass cutters, [†]Involved goods importers, traders, building contractor, [#]Constituted teachers, lecturers, soldiers, youth corpers, public servants, [§§]University, polytechnics, National Certificate in Education, School of Nursing, hygiene

facilities promotes health [Table II]. Also, about three-fifths of respondents knew that handwashing could reduce infections and prevent illnesses such as diarrhoea. Similarly, only two-fifths identified that sharing of personal materials among inmates predispose them to infections while four-fifths knew that eating with hands without washing predisposes to illnesses. Ocular lesions (46.2%) and cholera (74.8%) were associated with poor sanitation while environmental sanitation (79.3%), draining stagnant water around the cell (57.8), handwashing after work schedules (59.8%) and sanitary waste disposal (56.0%) could prevent sanitation and hygiene diseases. Moreover, 82% of respondents exhibited good knowledge, while 18% had poor knowledge of sanitation and hygiene services in the study area.

The attitude of respondents towards hygiene practices

In the study, a little over half of the respondents (51.0%) believed that handwashing with water and soap; and with water alone have the same effect on disease reduction while 68.1% believed that handwashing prevents diseases. In addition, 85.5% believed that frequent handwashing contributes to disease reduction, while 39.8% percieved that they are susceptible to respiratory diseases through poor sanitation and hygiene practices [Table III]. Overall, about three-fifths (58.0%) of respondents exhibited a positive attitude on hygiene practices.

Sanitation facilities and use characteristics by inmates

The study shows that 67% of inmates were resident in large dormitories that accommodate 61–90 inmates and most inmates (98.8%) had assessed to toilet facility, ranging from water closet (73.0%) to none (1.0%) by four inmates. The distance of their dormitories to the toilet facility also range from zero, (0) when inside the cell, to at a far distance from the cell by 5.3%, as shown in Table IV. Also, 1–30 inmates use the same toilet (11%) while the highest proportion of inmates that uses the toilet were between 61 and 90 inmates in 66.8% of the toilets.

Associations between knowledge, attitudes with associated sanitation and hygiene variables

As shown in Table V, 35% of inmates, aged 31–40 years, had good knowledge or sanitation and hygiene practices. Also, over half (51.8%) of the respondents who had spent over 1 year in the prison; about two-fifths (40.5%) who had secondary education, 43% and 27% of inmates that were, respectively, single and involved in business before imprisonment had good knowledge. Also, most inmates (76.5%) who had good knowledge practice good handwashing. Sanitation and hygiene knowledge of inmates was significantly associated with their handwashing practices ($P = 0.001$) while only handwashing ($P = 0.024$) and sanitary knowledge (0.001) were significantly associated with their attitudes [Table VI].

Prevalent diseases among prison inmates

A total of 11,141 visits were made to the prison health centre by inmates in 2009, (3257) 2010 (3816) and 2011 (3798), and treated for diverse illnesses; including malaria (69.5%), scabies (7.9%) and ringworm (6.8%), though asthma morbidity increased from 30 to 52, between 2009 and 2010 but declined to 78 in 2012 [Table VII].

Determinants associated with hygiene practice

Table VIII presented the determinants associated with inmates' attitude to hygiene practices. There was a significant association among age, marital status, occupational status and sanitary knowledge of respondents. Also, inmates within ages 31 and 40 years were 3.9 times more likely to have a positive attitude towards hygiene practices than those within ≤20 years old (odds ratio [OR]: 3.9, 95% CI: 1.484–10.060). In the same manner, prison inmates who

Table II: Respondents knowledge on sanitation and hygiene

Description of variables	Correct responses, *n* (%)	Incorrect responses, *n* (%)
Sanitation cannot prevent disease or illness	169 (42.3)	231 (57.7)
Frequent washing and cleaning of toilet, bathroom and clearing of bush is one of the ways to promote good hygiene	336 (84.0)	64 (16.0)
Handwashing cannot reduce transfer of germs into mouth or illness like diarrhoea	155 (38.8)	245 (61.2)
Infection cannot be transmitted through sharing of same materials (towel, cups and spoons) among inmates	168 (42.0)	232 (58.0)
Diseases already exist everywhere and not due to poor sanitation	249 (62.3)	151 (37.7)
When one eats with hands unwashed, it increases the risk of diarrhoea and worms	324 (81.0)	76 (19.0)
Many inmates, more than the capacity of the cell cannot lead to illness or any disease	155 (38.8)	245 (61.2)
In a healthy housing, more than five persons (overcrowding) is an enabling environment for disease transmission	285 (71.3)	115 (28.8)
Number of inmates in a cell affects the level of sanitation in the cell	282 (70.5)	118 (29.5)
Washing hands with soap are not the best way to reduce infection	140 (35.0)	260 (65.0)
Diarrhoea (passing stool for more than 3 times in a day) can be caused by poor sanitation	323 (80.8)	77 (19.2)
Dysentery (passing of atery stool with blood) can be caused by poor sanitation	274 (68.5)	126 (31.5)
Fever can be caused by poor sanitation	267 (66.8)	133 (33.2)
Worm infestation can be caused by poor sanitation	225 (56.3)	175 (43.8)
Skin infestation can be caused by poor sanitation	302 (75.5)	98 (24.5)
Malaria can be caused by poor sanitation	292 (73.0)	108 (27.0)
Ocular lesion (injury of the eye) can be caused by poor sanitation	185 (46.2)	215 (53.8)
Cholera can be caused by poor sanitation	299 (74.8)	101 (25.3)
Cough can be caused by poor sanitation	247 (61.8)	152 (38.0)
Diseases due to unhygienic environment can be reduced by sweeping and washing the cell and the environment	317 (79.3)	83 (20.8)
Ensuring there is no stagnant water around the yard can reduce diseases due to unhygienic environment	231 (57.8)	169 (42.3)
Handwashing with soap and water after every work can reduce diseases from inmates	239 (59.8)	161 (40.3)
Proper disposal of waste can help diseases due to poor sanitation	224 (56.0)	176 (44.0)

Table III: The attitude of respondents towards sanitation and hygiene

Description of variables	Responses				
	Strongly agree, *n* (%)	Agree, *n* (%)	Don't know, *n* (%)	Strongly disagree, *n* (%)	Disagree, *n* (%)
Washing hands with water and soap have the same effect on infection reduction as washing hands with water alone	84 (21.0)	121 (30.0)	10 (2.5)	122 (30.5)	63 (15.8)
Washing of hands cannot prevent any disease	57 (14.3)	59 (14.8)	12 (3.0)	169 (42.3)	103 (25.8)
Undergoing training on hygiene practices will not improve quality of one's health	76 (19.0)	111 (27.8)	23 (5.8)	123 (30.8)	67 (16.8)
Washing of hands is only important before and after eating	113 (28.3)	134 (33.5)	6 (1.5)	84 (21.0)	63 (15.8)
Frequent washing of hands with soap and water will reduce the risk of disease contamination	192 (48.0)	150 (37.5)	11 (2.8)	31 (7.8)	16 (4.0)
Washing my hands with soap is a good practice only after defecation	77 (19.3)	134 (33.5)	24 (6.0)	89 (22.3)	76 (19.0)
It is not a good practice for me when infected with the disease to use the same toilet with other inmates	122 (30.5)	114 (28.5)	12 (3.0)	82 (20.5)	70 (17.5)
When I am infected with diarrhoea, I can still live in the same cell with the other inmates	74 (18.5)	143 (35.8)	22 (5.5)	92 (23.0)	69 (17.3)
Diarrhoea cannot kill me	48 (12.0)	61 (15.3)	50 (12.5)	151 (37.8)	90 (22.5)
Respiratory infection is not a serious illness that I can have through unhygienic practices	53 (13.3)	106 (26.5)	53 (13.3)	117 (29.3)	71 (17.8)
You can have skin infection, eye infection and teeth decay when your personal hygiene is poor	146 (36.5)	141 (35.3)	28 (7.0)	65 (14.0)	29 (7.3)

had a poor knowledge score on sanitation were less likely to have a positive attitude to hygiene practices compared to those who had a good knowledge score on sanitation (OR: 0.5, 95% CI: 0.298, 0.905).

Table IV: Observed sanitation types and use characteristics

Variable	*n* (%)
Number of inmates in each cell	
1-30	46 (11.4)
31-60	43 (10.8)
61-90	268 (66.8)
>90	43 (10.8)
Availability of toilet facility	
Yes	395 (98.8)
No	5 (1.2)
Type of toilet facility	
Water closet	292 (73.0)
Traditional pit latrine	50 (12.5)
Ventilated Improved Pit Latrine	42 (10.5)
Bush disposal	16 (3.0)
None	4 (1.0)
The distance of toilet facility to cell	
Inside the cell	337 (84.3)
Outside the cell but available close by	38 (9.5)
Outside the cell but available farther away from the cell	23 (5.3)
None	4 (1.0)
Number of inmates that uses the toilet facility	
1-30	44 (11.0)
31-60	41 (10.3)
61-90	267 (66.8)
>90	44 (11.0)
None	4 (1.0)

VIP: Ventilated improved pit

DISCUSSION

Health is wealth and sanitation is dignity. Most (98.3%) inmates were male, in agreement with Odinkalu and Ehonwa,[12] Okochi *et al*.,[13] Okochi[14] and the National Human Development Report.[7] Coyle[15] also confirmed that the male population predominates in prisons,[16] though female confinement for awaiting trial and convicted inmates are provided in a few. A higher number of males in prison was explained by Okochi,[14] and NHDR[7] reports that common crimes that lead people to prison are rampant among the male gender than females. This could also be because Nigerian females are sensitive about the stigma associated with imprisonments.[17]

The mean age of inmates was 31.6 years, which is close to those reported by Okochi[14] among inmates at the same prison. There was a significant relationship between age and attitude towards hygiene practices ($P < 0.05$) – The higher the age group, the better the attitude towards hygiene practices. Studies by Okochi,[14] Ehonwa[18,19] and Oscar[20] reported that prisons are often populated with youths, in agreement with the study findings. Moreover, this age group is active and can maintain optimum sanitary conditions where domiciled provided the facilities are available.

The Agodi Prison housed inmates with diverse ethnic groups, out of which Yoruba ethnicity (66.3%) predominates. This could be explained by the fact that the prison accommodates inmates from the justice system in the Yoruba catchment states, in congruence with the findings of Okochi.[13,14]

Table V: The association between sociodemographic characteristics, sanitary knowledge of inmates in the study area

Variables (*n*=400)	Good sanitary knowledge, *n* (%)	Poor sanitary knowledge, *n*. (%)	χ^2	*P*
Age group (years)				
≤20	21 (5.3)	6 (1.5)	2.790	0.425
21-30	130 (32.5)	35 (8.8)		
31-40	140 (35.0)	24 (6.0)		
≥41	35 (8.8)	9 (2.3)		
Education				
No formal	20 (5.0)	9 (2.3)	6.987	0.072
Primary	45 (11.3)	11 (2.8)		
Secondary	162 (40.5)	41 (10.3)		
Tertiary	99 (24.8)	13 (3.3)		
Marital status				
Single	172 (43.0)	39 (9.8)	4.245	0.374
Cohabiting	11 (2.8)	2 (0.5)		
Married	107 (26.8)	30 (7.5)		
Divorced/widowed	8 (2.0)	1 (0.3)		
Separated	28 (7.0)	2 (0.5)		
Occupation				
Civil servant	67 (16.8)	10 (2.5)	6.604	0.158
Business	108 (27.0)	26 (6.5)		
Artisan	84 (21.0)	20 (5.0)		
Student	19 (4.8)	1 (0.3)		
Unemployed	48 (12.0)	17 (4.3)		

Table V: Contd...

Variables (*n*=400)	Good sanitary knowledge, *n* (%)	Poor sanitary knowledge, *n*. (%)	χ^2	*P*
Length of time spent in prison				
≤1 year	119 (29.8)	34 (8.5)	2.277	0.131
>year	207 (51.8)	40 (10.0)		
Hand washing practices				
Good	306 (76.5)	61 (15.3)	10.414	0.001*
Poor	20 (5.0)	13 (3.5)		

*P<0.05

Table VI: The sociodemographic characteristics and attitude of the inmates towards hygiene practices in the study area

Variables	Good sanitary knowledge, *n* (%)	Poor sanitary knowledge, *n* (%)	χ^2	*P*
Age group (years)				
≤20	8 (2.0)	19 (4.8)	14.400	0.002*
21-30	89 (22.3)	79 (19.0)		
31-40	108 (27.0)	56 (14.0)		
≥41	27 (6.8)	17 (4.3)		
Education				
No formal	16 (4.0)	13 (3.3)	19.300	0.000*
Primary	34 (8.5)	22 (5.5)		
Secondary	99 (24.8)	104 (26.0)		
Tertiary	83 (20.8)	29 (7.3)		
Marital status				
Single	119 (29.8)	92 (23.0)	21.50	0.000
Cohabiting	3 (0.8)	10 (2.5)		
Married	76 (19.0)	61 (15.3)		
Divorced/widowed	7 (1.8)	2 (0.5)		
Separated	27 (6.8)	3 (0.5)		
Occupation				
Civil servant	56 (14.0)	21 (5.3)	11.900	0.018
Business	75 (18.8)	59 (14.8)		
Artisan	60 (15.0)	44 (11.0)		
Student	12 (3.0)	8 (2.0)		
Unemployed	29 (7.3)	36 (9.0)		
Length of time spent in prison				
≤1 year	89 (22.3)	64 (16.0)	0.003	0.957
>year	143 (35.8)	104 (26.0)		
Handwashing practices				
Good	219 (54.8)	148 (37.0)	5.111	0.024*
Poor	13 (3.3)	20 (3.5)		
Sanitary knowledge				
Good	202 (50.5)	124 (31.0)	11.362	0.001*
Poor	30 (7.5)	44 (11.0)		

*Significant at P<0.05

Knowledge is power. The good knowledge on what constitute sanitary conditions by most respondents is germane to promote safe behaviour through the use and maintenance of water supply, sanitation and hygiene infrastructures. The good knowledge correlates with the literacy levels of inmates. The fact that four-fifths respondents knew that diseases due to the unhygienic environment could be reduced by environmental sanitation and personal hygiene shows a good knowledge level by the respondents.

The prison was overcrowded and had poor living, sanitary and health conditions. Overcrowding could overwhelm the response of the prison health system to inmates health needs. The over two-folds in the lock-ups of inmates compared to its design capacity, agreed with the findings by Enuku,[21] Ojukwu and Briggs,[22] and Oloyede,[23] most were awaiting trial in custody. Also, NHDR[7] observed that the number of prison inmates, as a proportion of maximum prison capacity were quite high, ranging from 90% to 142%, between years

Table VII: Inmates' health problems treated in the prison clinic between January 2009 and August 2011

Common health problems treated in Agodi prison Clinic	January 2009-December 2009	January 2010-December 2010	January 2011-August 2011	Total (%)
Malaria	2521 (71.5)	2622 (68.7)	2600 (68.5)	7743 (69.5)
Peptic ulcer	42 (1.2)	46 (1.2)	57 (1.5)	145 (1.3)
Typhoid	30 (0.9)	48 (1.3)	36 (1.0)	114 (1.0)
Dysentery	105 (3.0)	67 (1.8)	82 (2.2)	254 (2.3)
Diarrhoea	114 (3.2)	18 (0.5)	61 (1.6)	193 (1.7)
Tuberculosis	32 (0.9)	63 (1.7)	40 (1.1)	135 (1.2)
Asthma	30 (0.9)	52 (1.4)	78 (2.1)	160 (1.4)
Scabies	228 (6.5)	315 (8.3)	337 (8.9)	880 (7.9)
Ring worm	274 (7.8)	259 (6.8)	226 (6.0)	759 (6.8)
Conjunctivitis	18 (0.5)	67 (1.8)	41 (1.1)	126 (1.1)
Wound	46 (1.3)	60 (1.6)	65 (1.7)	171 (1.5)
Arthritis	41 (1.2)	153 (4.0)	150 (4.0)	344 (3.1)
Urinary infection	29 (0.8)	21 (0.6)	3 (0.1)	53 (0.5)
Cataract	8 (0.2)	7 (0.2)	22 (0.6)	37 (0.3)
Nose/ear/throat infection	8 (0.2)	7 (0.2)	0 (0.0)	15 (0.1)
Glaucoma	1 (0.0)	0 (0.0)	0 (0.0)	1 (0.0)
Pneumonia	0 (0.0)	8 (0.2)	0 (0.0)	8 (0.1)
Pelvic infection	0 (0.0)	3 (0.1)	0 (0.0)	3 (0.0)
Total	3527 (31.7)	3816 (34.3)	3798 (34.1)	11,141 (100)

Source: Agodi Prison Clinic (2011)

Table VIII: Odds ratio from logistic regression predicting inmates' attitude towards hygiene practices in the study area

Variables	*B*-coefficient	OR	95% CI		*P*
			Lower	Upper	
Age group (years)					
≤20††					
21-30	0.959	2.609	1.023	6.651	0.045*
31-40	1.352	3.864	1.484	10.060	0.006*
≥41	1.065	2.902	0.918	9.168	0.70
Education					
No formal††					
Primary	−0.390	0.962	0.356	2.598	0.939
Secondary	−0.466	0.627	0.270	1.456	0.278
Tertiary	0.265	1.304	0.511	3.330	0.579
Marital status					
Single††					
Cohabiting	−1.581	0.206	0.500	0.842	0.028*
Married	−0.113	0.893	0.533	1.498	0.669
Divorced/widowed	1.201	3.323	0.626	17.631	0.158
Separated	1.735	5.667	1.558	20.623	0.008*
Occupation					
Civil servant††					
Business	−0.613	0.542	0.282	1.041	0.066
Artisan	−0.435	0.647	0.323	1.299	0.221
Student	−0.561	0.571	0.192	1.701	0.314
Unemployment	−0.731	0.481	0.220	1.052	0.670
Handwashing practices					
Good††					
Poor	0.619	1.857	0.838	4.119	0.128
Sanitary knowledge					
Good††					
Poor	−0.656	0.519	0.298	0.905	0.021*

††Variable used for reference, *P<0.05. OR: Odds ratio, CI: Confidence interval

2008 and 2012, besides the dilapidation state.[7,24] Therefore, existing facilities in Nigerian prisons are overstretched, and living conditions become punitive than correctional, a platform that increases their potential for future crime when released.[7]

The passage of excreta is a product of life and inmates have the right to use the toilet when required. In this regard, the overcrowding nature of the dormitories' conditions high wait-time by inmates before use of toilet, a feature of overcrowding.[25] However, those whose cells had not toilet, though rare, can use alternative toilet facilities, a similar situation to those dormitories whose toilet facilities are far from when they domiciled. The toilet use situation in the provision can promote unhygienic conditions that can herald the epidemic of faecal related diseases among inmates, as observed by.[25,26]

The effectiveness of handwashing at critical periods in reducing diarrhoea episodes[27,28] and acute respiratory infections[28,29] are not in doubt, though over two-thirds (68.1%) respondents perceived that hand washing could not prevent diseases, while almost half (48%) agreed that frequent hands washing with soap and water, will reduce the risk of infectious diseases in our study. This is similar to findings that hands were washing after defecation and before meals was scarcely practised by inmates in Owerri prison.[30] This could, however, be prevented by health promotion and education. The prevalence of water washed diseases (scabies and ringworm infections) is indicative of water scarcity and of poor quality in prison, which might be as a result of the use of the existing hand-dug wells used for drinking and other domestic needs, which perhaps could have been contaminated.

The study further showed that knowledge is among the significant predictors of attitude towards hygiene practices in agreement with Oladepo[31] and the Water, sanitation and hygiene[32] that reported that key behaviour; such as; poor disposal of waste, the nauseating stench from clogged drains and poor habits to environmental health, influence the non-sustainability of sanitary facilities.

CONCLUSIONS

The sanitary and living conditions in prison were deplorable and undignified, despite the inmates having good knowledge and positive attitudes towards sanitation and personal hygiene attributes. These conditions and overcrowding in correctional cells predispose inmates to poor health standards. Malaria, ringworm and scabies were most common which could decline with upgrades of basic water, sanitation, hygiene facilities, apart from windows and doors screenings.

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Conflicts of interest

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