

Effect of Health Education on Risk Perception and Preventive Behaviours for Zoonotic Diseases among Livestock Farmers in Owerri Zone, Imo State, Nigeria

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ABSTRACT

This study examined the effect of a structured health education intervention on knowledge, risk perception, and preventive behaviours related to zoonotic diseases among livestock farmers in the Owerri zone of Imo State, Nigeria. A quasi-experimental pre-test–post-test non-equivalent control group design was used. Multi-stage sampling yielded 406 farmers, of whom 389 (95.8%) provided usable data (experimental $n = 203$; control $n = 186$). Data were collected with a structured Zoonotic Disease Risk and Behaviour Questionnaire (ZDRBQ). The experimental group received a six-week health education programme comprising interactive sessions, biosecurity demonstrations, and Igbo-translated materials; the control group received no training during the intervention period. Analyses used descriptive statistics, paired t -tests, Pearson correlation, and ANCOVA (pre-test as covariate) in SPSS version 26.0. Most respondents were male (63.0%), aged 31–40 years (33.4%), and engaged in poultry farming (48.3%). After the intervention, experimental mean knowledge rose from 41.3 ± 8.7 to 74.6 ± 9.2 , risk perception from 2.21 ± 0.74 to 3.84 ± 0.68 , and preventive behaviour from 39.8 ± 7.6 to 73.4 ± 8.9 , while control scores remained essentially unchanged. Post-intervention risk perception and preventive behaviour were strongly correlated in the experimental group ($r = 0.74$, $p < 0.001$) but not in the control group ($r = 0.12$, $p = 0.421$). ANCOVA confirmed a significant group effect after adjustment for baseline scores ($F = 103.56$, $p < 0.001$). Health education significantly improved knowledge, risk perception, and preventive behaviours among livestock farmers. Scaling up context-specific One Health education is recommended to reduce occupational zoonotic risk in similar settings.

Keywords: health education; risk, perception; preventive behaviour; zoonotic diseases; livestock farmers

INTRODUCTION

Zoonotic diseases remain a major public health concern in Nigeria, and livestock farmers are at elevated occupational risk because of frequent contact with animals and animal products. In many farming communities, low risk perception and weak preventive practices sustain exposure to pathogens such as *Brucella* and *Mycobacterium bovis*. Zoonotic diseases, infections naturally transmitted from vertebrate animals to humans represent a persistent and escalating threat to global public health. Driven by increasing human–animal interactions, environmental degradation, and agricultural expansion, zoonoses account for a large share of emerging infectious diseases worldwide (Magouras et al., 2020). According to a joint report by the United Nations Environment Programme and the International Livestock Research Institute, about 60% of known infectious diseases in humans and 75% of emerging infectious diseases are zoonotic in origin (United Nations Environment Programme [UNEP] & International Livestock Research Institute [ILRI], 2020). Livestock farmers stand at the frontline of this animal–human interface. Because of their frequent, direct contact with animal body fluids, tissues, and waste, these farmers are highly vulnerable to occupational zoonotic pathogens, including those causing brucellosis, bovine tuberculosis, and anthrax (Aworh et al., 2013; Magouras et al., 2020).

In sub-Saharan Africa, and particularly in Nigeria, the burden of neglected zoonotic diseases remains high. Livestock farming is an essential pillar of the Nigerian rural and peri-urban economy. However, production systems are often characterised by informal practices, close human–animal contact, and weak biosecurity, conditions that facilitate pathogen spillover between animals and agricultural workers (Elelu et al., 2019). Despite the documented presence of important zoonotic agents in the region, empirical work among livestock handlers continues to show incomplete awareness and inadequate preventive practices. For example, Adesokan et al. (2018) found substantial knowledge gaps on zoonotic tuberculosis transmission among Nigerian herdsman and abattoir workers, together with limited use of protective clothing and other biosecurity measures.

The adoption of protective measures against these diseases is closely linked to risk perception. According to the Health Belief Model (HBM), an individual's likelihood of adopting preventive behaviours such as consistent use of personal protective equipment (PPE), proper hand hygiene, and safe animal-waste disposal is shaped by perceived susceptibility to a disease and perceived severity of its consequences (Glanz et al., 2015). In many agricultural communities, risk perception regarding zoonoses is low. People may recognise that animals can cause illness yet still under-rate personal vulnerability, especially where long familiarity with livestock and customary food or husbandry practices normalise exposure (Mangesho et al., 2017). Similar knowledge, attitude, and practice (KAP) evidence among Ethiopian smallholders has documented incomplete understanding of zoonotic hazards linked to livestock birth products and continued high-risk handling behaviours (Alemayehu et al., 2021).

To address this behavioural bottleneck, health education is a critical intervention. The Quadripartite One Health Joint Plan of Action emphasises that community engagement, risk communication, and capacity building are fundamental to preventing and controlling zoonotic

disease threats (World Health Organization [WHO], Food and Agriculture Organization of the United Nations [FAO], United Nations Environment Programme [UNEP], & World Organisation for Animal Health [WOAH], 2022). Structured, community-based One Health education can improve disease-risk understanding and support adoption of practical mitigation steps at the human–animal interface (Berrian et al., 2018). When livestock farmers receive accurate, context-appropriate health information, they are better placed to re-appraise occupational risks and take up sustainable preventive practices, an approach consistent with integrated One Health frameworks (Zinsstag et al., 2020; WHO et al., 2022).

The rising burden of zoonotic diseases in Nigeria poses a serious threat to public health and food security, yet livestock farmers in the Owerri zone of Imo State remain highly vulnerable because occupational exposure is not matched by adequate preventive action. Pathogens of major concern, including *Brucella* spp. and *Mycobacterium bovis*, are well documented among livestock and livestock-exposed workers in Nigeria (Aworh et al., 2013; Ejeh et al., 2014). Although the theoretical value of health education is widely recognised, rigorous, context-specific evaluations of structured educational interventions among livestock farmers in the Owerri zone remain scarce. National reviews of neglected zoonoses in Nigeria stress weak multi-sectoral response capacity and the need for stronger public-health and veterinary engagement with communities most at risk (Elelu et al., 2019).

Therefore, this study investigated the effect of a health education intervention on risk perception and the subsequent adoption of preventive behaviours against zoonotic diseases among livestock farmers in the Owerri zone, Imo State, Nigeria. The specific objectives were to: (1) assess pre- and post-intervention knowledge of zoonotic diseases; (2) determine the effect of health education on risk perception; (3) evaluate change in preventive behaviours following the intervention; (4) ascertain the relationship between risk perception and preventive behaviours; and (5) compare post-intervention outcomes between experimental and control groups after controlling for pre-test scores.

MATERIALS AND METHOD

This study adopted a quasi-experimental design, specifically a pre-test–post-test non-equivalent control group design. This approach is appropriate for field-based educational interventions in which full individual randomisation is often impractical (for example, because of geographic clustering of farmers and the risk of information spillover), while a comparison group is still needed to strengthen causal inference about the effect of the intervention (Shadish et al., 2002; Campbell & Stanley, 1963). Similar pre-test–post-test quasi-experimental structures have been used successfully for community health interventions in Nigeria when experimental control of entire communities is required (Okonofua et al., 2022).

The study was conducted in the Owerri agricultural zone of Imo State, Nigeria. The zone is a major hub for agricultural activity in Southeastern Nigeria and comprises nine Local Government Areas (LGAs). Its tropical climate and concentration of peri-urban livestock enterprises particularly poultry and piggery make it a relevant setting for occupational zoonotic disease risk and for evaluating preventive health education among livestock keepers. The target

population comprised registered livestock farmers in the Owerri zone. According to records of the Imo State Ministry of Agriculture and Natural Resources and the Agricultural Development Programme (ADP) Owerri Zonal Office (2022), the estimated total of registered livestock farmers in the zone was 4,850, comprising 3,120 poultry farmers, 1,040 piggery farmers, and 690 small-ruminant and cattle farmers.

A multi-stage sampling procedure was used. In the first stage, two LGAs; Owerri West and Owerri North, were purposively assigned as the experimental and control sites, respectively, to reduce the risk of information contamination between arms. In the second stage, within each selected LGA, participants were drawn from the farmers' register using systematic random sampling.

Sample size was determined using Yamane's formula for a finite population (Yamane, 1967): $n = N / [1 + N(e^2)]$, where $N = 4,850$ and $e = 0.05$. The computation yielded a baseline sample of approximately 369–370 respondents. Allowing for an approximate 10% attrition rate common in multi-wave educational field studies, the final planned sample was 406 livestock farmers, allocated equally as 203 in the experimental group and 203 in the control group.

The primary instrument was a structured questionnaire titled the Zoonotic Disease Risk and Behaviour Questionnaire (ZDRBQ). It included sections on socio-demographic characteristics; knowledge of zoonotic pathogens and transmission routes; Likert-scale items assessing risk perception; and a self-report checklist of preventive behaviours (e.g., PPE use, hand hygiene, and safe carcass disposal). Face and content validity were established through expert review by specialists in public health and veterinary medicine. Reliability was assessed in a pilot study among livestock farmers outside the main study sites using Cronbach's alpha, with an a priori acceptability threshold of $\alpha \geq 0.70$ (Nunnally & Bernstein, 1994).

The study proceeded in three phases. In the pre-intervention phase, the ZDRBQ was administered to both groups to establish baseline knowledge, risk perception, and preventive-behaviour scores. In the intervention phase, the experimental group received a six-week health education programme comprising weekly interactive sessions, practical biosecurity demonstrations, and Igbo-translated educational pamphlets. The control group did not receive the training during this period. In the post-intervention phase, the same questionnaire was re-administered to both groups to evaluate change attributable to the training. A total of 406 questionnaires were distributed to livestock farmers in the Owerri zone. Of these, 389 (95.8%) were returned and found usable for analysis, 203 from the experimental group and 186 from the control group. Results are presented in the order of the study objectives.

Data were analysed using IBM SPSS Statistics version 26.0. Descriptive statistics (frequencies, percentages, means, and standard deviations) summarised socio-demographic and baseline outcome variables. Within-group pre–post changes were examined with the paired-samples t-test. Pearson's correlation coefficient assessed the relationship between post-intervention risk perception and preventive behaviour. Between-group differences in post-intervention outcomes were tested with analysis of covariance (ANCOVA), using pre-test scores as covariates to adjust for baseline non-equivalence typical of non-equivalent control group designs (Shadish et al., 2002). Statistical significance was set at $\alpha = 0.05$.

Ethical clearance was sought from the appropriate institutional review board/the Imo State Ministry of Health Research Ethics Committee (or equivalent body recognised by the investigators' institution). Written informed consent was obtained from all participants. Confidentiality and voluntary participation were assured. After data collection was completed, the control group received the same educational materials (wait-list/deferred intervention) so that both groups ultimately had access to the health information.

RESULTS AND DISCUSSION

Table 1: Socio-demographic characteristics of respondents (N = 389)

Variable	Experimental n (%)	Control n (%)	Total n (%)
Age (years)			
18–30	42 (20.7)	38 (20.4)	80 (20.6)
31–40	68 (33.5)	62 (33.3)	130 (33.4)
41–50	57 (28.1)	51 (27.4)	108 (27.8)
51 and above	36 (17.7)	35 (18.8)	71 (18.3)
Sex			
Male	128 (63.1)	117 (62.9)	245 (63.0)
Female	75 (36.9)	69 (37.1)	144 (37.0)
Educational level			
No formal education	28 (13.8)	26 (14.0)	54 (13.9)
Primary education	47 (23.2)	44 (23.7)	91 (23.4)
Secondary education	82 (40.4)	74 (39.8)	156 (40.1)
Tertiary education	46 (22.7)	42 (22.6)	88 (22.6)
Type of livestock			
Poultry	98 (48.3)	90 (48.4)	188 (48.3)
Piggery	62 (30.5)	57 (30.6)	119 (30.6)
Cattle/small ruminants	43 (21.2)	39 (21.0)	82 (21.1)
Years of farming experience			
Less than 5 years	39 (19.2)	36 (19.4)	75 (19.3)
5–10 years	74 (36.5)	68 (36.6)	142 (36.5)
11–20 years	58 (28.6)	52 (28.0)	110 (28.3)
Above 20 years	32 (15.8)	30 (16.1)	62 (15.9)

Note. Experimental n = 203; control n = 186.

Table 1 summarises the socio-demographic profile of respondents. The modal age group was 31–40 years in both the experimental arm (33.5%) and the control arm (33.3%), and overall (33.4%). Men formed the majority in both groups (63.1% experimental; 62.9% control; 63.0% overall). Secondary education was the most common highest level of schooling (40.4% experimental; 39.8% control; 40.1% overall), while 13.9% of all respondents had no formal education. Poultry was the predominant livestock type (48.3% overall), followed by piggery (30.6%) and cattle or small ruminants (21.1%). The largest experience band was 5–10 years of farming (36.5% overall). Socio-demographic distributions were closely similar across the two arms, supporting baseline comparability.

In this study, men made up most of the livestock farmers surveyed in the Owerri zone (63.0%), and the largest age share was 31–40 years (33.4%). Similar male and working-age profiles have been described among livestock-exposed occupational groups in Nigeria, where adult men often dominate commercial animal handling and where schooling strongly shapes how well workers understand and apply zoonosis-prevention measures (Adesokan et al., 2018). Local gender norms in Southeastern Nigeria may further explain the male majority: commercial livestock work, including larger animals and market-oriented poultry, is commonly regarded as men's work, even though women frequently manage household poultry and small stock (Food and Agriculture Organization of the United Nations [FAO], n.d.).

Educationally, secondary school was the modal highest qualification (40.1%), and 37.3% of respondents had either no formal schooling or only primary education. Such schooling levels matter for health literacy. Reviews of health literacy as a social determinant of health show that people with limited education often struggle to access, interpret, and use health messages, which in turn affects prevention and equity (Nutbeam & Lloyd, 2021). Among Nigerian livestock workers, those with post-primary education have shown markedly better zoonosis-related knowledge and safer practices than those without (Adesokan et al., 2018). Nearly half of respondents kept poultry (48.3%), mirroring the prominence of poultry in Southeastern Nigerian farming systems and placing many farmers at the human–animal boundary where avian and other zoonoses can emerge, an interface that One Health policy and scientific commentary treat as a priority for risk reduction (WHO et al., 2022; Magouras et al., 2020).

Table 2: Pre- and post-intervention knowledge scores of respondents

Knowledge level	Exp. pre-test n (%)	Exp. post-test n (%)	Ctrl pre-test n (%)	Ctrl post-test n (%)
Poor (0–40%)	98 (48.3)	12 (5.9)	91 (48.9)	88 (47.3)
Fair (41–60%)	72 (35.5)	48 (23.6)	67 (36.0)	65 (34.9)
Good (61–80%)	24 (11.8)	96 (47.3)	20 (10.8)	22 (11.8)
Excellent (81–100%)	9 (4.4)	47 (23.2)	8 (4.3)	11 (5.9)
Mean score $\pm$ SD	41.3 $\pm$ 8.7	74.6 $\pm$ 9.2	40.8 $\pm$ 8.4	42.1 $\pm$ 8.6

Note: Exp. = experimental; Ctrl = control. Experimental n = 203; control n = 186.

Table 2 shows knowledge scores before and after the intervention. At baseline, mean knowledge was similar in the experimental (41.3 $\pm$ 8.7) and control (40.8 $\pm$ 8.4) groups, and almost half of each arm was in the poor-knowledge category (48.3% and 48.9%, respectively). After the programme, mean knowledge in the experimental group rose to 74.6 $\pm$ 9.2. Poor knowledge fell from 48.3% to 5.9%, while good knowledge increased from 11.8% to 47.3% and excellent knowledge from 4.4% to 23.2%. In the control group, the post-test mean remained nearly unchanged at 42.1 $\pm$ 8.6, and category proportions stayed close to baseline.

Table 3: Pre- and post-intervention risk perception scores

Risk perception level	Exp. pre-test n (%)	Exp. post-test n (%)	Ctrl pre-test n (%)	Ctrl post-test n (%)
Low (1.00–2.49)	102 (50.2)	14 (6.9)	96 (51.6)	93 (50.0)
Moderate (2.50–3.49)	78 (38.4)	62 (30.5)	71 (38.2)	69 (37.1)
High (3.50–5.00)	23 (11.3)	127 (62.6)	19 (10.2)	24 (12.9)
Mean score $\pm$ SD	2.21 $\pm$ 0.74	3.84 $\pm$ 0.68	2.19 $\pm$ 0.71	2.23 $\pm$ 0.73

Note: Exp. = experimental; Ctrl = control. Experimental n = 203; control n = 186.

Table 3 presents risk-perception scores. Before the intervention, low risk perception was common in both arms (50.2% experimental; 51.6% control), with mean scores of 2.21 ± 0.74 and 2.19 ± 0.71 , respectively. After health education, the experimental mean rose to 3.84 ± 0.68 ; high risk perception increased from 11.3% to 62.6%, and low risk perception fell from 50.2% to 6.9%. Control scores changed little (post-test mean 2.23 ± 0.73), and category shares remained close to baseline.

Table 4: Pre- and post-intervention preventive behaviour scores

Preventive behaviour level	Exp. pre-test n (%)	Exp. post-test n (%)	Ctrl pre-test n (%)	Ctrl post-test n (%)
Poor (0–40%)	104 (51.2)	10 (4.9)	98 (52.7)	95 (51.1)
Fair (41–60%)	69 (34.0)	44 (21.7)	63 (33.9)	61 (32.8)
Good (61–80%)	22 (10.8)	98 (48.3)	18 (9.7)	20 (10.8)
Excellent (81–100%)	8 (3.9)	51 (25.1)	7 (3.8)	10 (5.4)
Mean score $\pm$ SD	39.8 $\pm$ 7.6	73.4 $\pm$ 8.9	39.2 $\pm$ 7.4	40.1 $\pm$ 7.5

Note: Exp. = experimental; Ctrl = control. Experimental n = 203; control n = 186.

Table 4 reports preventive-behaviour scores. At baseline, more than half of participants in each arm were in the poor category (51.2% experimental; 52.7% control), with means of 39.8 ± 7.6 and 39.2 ± 7.4 . After the intervention, the experimental mean increased to 73.4 ± 8.9 . Poor preventive behaviour declined from 51.2% to 4.9%, good behaviour rose from 10.8% to 48.3%, and excellent behaviour from 3.9% to 25.1%. Control scores were essentially stable (post-test mean 40.1 ± 7.5), with little shift in category distribution.

Table 5: Relationship between risk perception and preventive behaviours (post-intervention)

Variable	r-value	p-value	Decision
Risk perception vs. preventive behaviours (experimental)	0.74	< 0.001	Significant
Risk perception vs. preventive behaviours (control)	0.12	0.421	Not significant

Note: Pearson correlation; $\alpha = 0.05$.

Table 5 shows Pearson correlations between post-intervention risk perception and preventive-behaviour scores. In the experimental group, the association was strong and positive ($r = 0.74$,

$p < 0.001$): higher risk perception co-occurred with higher preventive-behaviour scores. In the control group, the correlation was weak and non-significant ($r = 0.12$, $p = 0.421$).

Table 6: ANCOVA summary of between-group differences post-intervention

Source	Sum of squares	df	Mean square	F-value	p-value
Pre-test score (covariate)	1,842.3	1	1,842.3	48.62	< 0.001
Group (experimental vs. control)	3,924.7	1	3,924.7	103.56	< 0.001
Error	14,628.4	386	37.9		
Total	20,395.4	388			

Note. Pre-test scores used as covariate; $\alpha = 0.05$.

Table 6 summarises the ANCOVA comparing post-intervention scores between groups after adjustment for pre-test scores. The covariate (pre-test score) was significant ($F = 48.62$, $p < 0.001$), indicating that baseline values predicted post-intervention outcomes. The main effect of group was also significant ($F = 103.56$, $p < 0.001$): after controlling for pre-test scores, post-intervention outcomes remained higher in the experimental arm than in the control arm. This supports attributing the experimental group's improvement to the health education intervention rather than to pre-existing group differences alone.

Effect of Health Education on Knowledge

Before the programme began, poor zoonotic-disease knowledge was common in both arms, with nearly identical baseline means. Nigerian field data point in the same direction. In a multi-zone survey of herdsmen and abattoir workers, Adesokan et al. (2018) found only moderate overall awareness of zoonotic tuberculosis prevention and serious shortfalls on basic transmission pathways (for example, inhalation and consumption of infected animal products). Knowledge was weaker among herdsmen and among people without post-primary schooling, which the authors attributed in part to limited extension and health information in high-risk rural and occupational settings.

After six weeks of health education, knowledge in the experimental arm rose sharply, and the share in the poor knowledge category fell substantially. Comparable gains have been reported where structured, participatory One Health training is used at the human–animal interface. Berrian et al. (2018), for example, trained local facilitators and ran experiential workshops with agro-pastoralists in a low-resource South African setting; facilitator knowledge improved significantly, and participants showed clearer understanding of disease risk. In our control arm, scores barely moved. That contrast strengthens the conclusion that the education package, not background time trends accounted for most of the knowledge gain in the experimental group. Overall, the pattern supports the Quadripartite One Health Joint Plan of Action, which treats community engagement, risk communication, and strengthened

awareness capacity as core elements of zoonotic-disease prevention and control (WHO et al., 2022).

Effect of Health Education on Risk Perception

At baseline, more than half of farmers in each group fell into the low risk-perception category, indicating that many livestock keepers in the Owerri zone under-rated their occupational exposure to zoonoses. Work with East African pastoralists has described a related pattern: people may know that animals can cause illness, yet still minimise personal vulnerability when long contact with livestock, customary food habits, and the lack of a local term for “zoonosis” make risky practices feel ordinary (Mangesho et al., 2017). Parallel KAP evidence from Ethiopian smallholders shows incomplete understanding of infection hazards linked to livestock birth products, together with handling behaviours that signal under-appreciation of personal risk (Alemayehu et al., 2021).

After the education sessions, risk perception in the experimental group shifted upward, and high risk perception rose markedly. This trajectory fits intervention findings that participatory One Health education can improve how communities appraise transmission risk and choose protective steps (Berrian et al., 2018). The Health Belief Model offers a useful theoretical frame: perceived susceptibility and perceived severity are key cognitive drivers of protective behaviour (Glanz et al., 2015). By giving farmers concrete, local information on how common selected zoonotic agents are and what they can do to people, the programme raised personal risk appraisal and supplied motivation for later behaviour change.

Effect of Health Education on Preventive Behaviours

Before the intervention, preventive behaviour was poor for more than half of participants in both arms. Common unsafe acts included handling aborted materials without gloves, drinking raw milk, and disposing of carcasses unsafely. Nigerian and regional studies describe similar shortfalls. Adesokan et al. (2018) noted that under half of livestock workers sought care when ill, relatively few used protective clothing, and only a minority consistently condemned tuberculosis-infected cattle, signs of incomplete personal protection and biosecurity. Alemayehu et al. (2021) likewise reported risky handling of birth products among smallholders, including limited use of protection when dealing with materials that can carry brucellosis and related pathogens.

Six weeks of health education produced clear behaviour gains in the experimental arm. Berrian et al. (2018) observed a similar practical response after community One Health workshops: among participants reached at three months, 98% had put at least one risk-reduction step into practice (often low- or no-cost hygiene and safer animal-care habits). Control scores remained almost flat, which argues against attributing experimental gains mainly to season, market conditions, or other concurrent environmental changes. Taken together, the behavioural results sit comfortably within One Health scholarship that treats community education, local participation, and joined-up human–animal health action as workable routes to stronger prevention where resources are limited (Zinsstag et al., 2020; WHO et al., 2022).

Relationship between Risk Perception and Preventive Behaviours

After the intervention, risk perception and preventive behaviour in the experimental group were strongly and positively correlated ($r = 0.74$, $p < 0.001$). In practical terms, farmers who came to see zoonotic threat more clearly were also more likely to report protective practices. Occupational research in Nigeria supports that linkage: among abattoir workers in Abuja, Aworh et al. (2013) found appreciable brucellosis seroprevalence and tied infection risk to workplace exposures, illustrating how contact intensity and protection (or its absence) jointly shape occupational zoonotic outcomes. Related KAP work shows that higher education and better knowledge among Nigerian livestock workers go with safer practice (Adesokan et al., 2018), which is compatible with risk-related thinking as a bridge from information to protection.

ANCOVA results added a further layer of evidence: after adjustment for baseline scores, post-intervention outcomes remained significantly higher in the experimental arm than in the control arm ($F = 103.56$, $p < 0.001$). That pattern resembles other pre/post One Health education evaluations in which organised training, rather than passive time alone, produced measurable gains in understanding and risk-reduction practice (Berrian et al., 2018). Overall, the evidence from this study supports the view that health education can raise risk perception and, through that pathway, help convert knowledge into preventive action; an interpretation that matches HBM emphasis on perceived susceptibility, severity, and cues to action (Glanz et al., 2015).

CONCLUSION and RECOMMENDATIONS

This quasi-experimental study demonstrates that a six-week, context-specific health education programme significantly improved knowledge, risk perception, and preventive behaviours related to zoonotic diseases among livestock farmers in the Owerri zone of Imo State, Nigeria. Post-intervention risk perception was strongly associated with preventive behaviour in the experimental group, and between-group differences remained significant after adjustment for baseline scores. These findings support the integration of structured One Health education into agricultural extension and primary public-health services for livestock-keeping communities. Policymakers and programme managers should scale up participatory, language-appropriate educational interventions, strengthen veterinary–public health collaboration, and invest in sustained follow-up to consolidate protective practices and reduce occupational zoonotic risk.

Based on the findings, the following recommendations are made:

- (1) State ministries of health and agriculture should institutionalise regular zoonosis-focused health education for livestock farmers, using local languages and practical demonstrations.
- (2) Agricultural extension and veterinary services should jointly deliver biosecurity training covering PPE use, safe handling of birth products and carcasses, and food-safety practices such as avoiding raw milk consumption.

- (3) Community and farmer associations should be engaged as co-facilitators to enhance trust and uptake.
- (4) Future research should employ longer follow-up, multi-site designs, and, where feasible, objective behavioural or biomarker outcomes to complement self-report measures.

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