

Oklahoma Early Childhood Staff’s Knowledge and Perceptions of Indoor Air Quality in their Early Childhood Settings



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INTRODUCTION

Indoor Air Quality (IAQ) in classrooms is important (Roberts et al., 2019; Madureira, 2014). IAQ has a direct impact on the learning process, as well as the physical and mental well-being of children (Robert, 2019; Sá, 2019; D’Angelo et al., 2023; Kolarik et al., 2016; Ferreira et al., 2014; Araújo-Martins, 2014), and the rate of absenteeism for both children and teachers (Madureira, 2009; Simon, 2010). Most research has been done with older children, with less focused on younger children who may be more impacted due to their developmental characteristics. If ECE teachers and administrators have information about IAQ and its impact, this information can inform their efforts to offer high-quality settings to promote development and learning (Madureira et al., 2009; Gabriel et al., 2021; Scheepers, 2015). We conducted a study to gauge teachers’ and administrators’ understanding of and knowledge about IAQ in ECE classrooms for children between the ages of 1 and 5.

METHOD

This study is part of a larger study, named OK-AIR, that aims to explore the impact of IAQ in ECE settings. A survey was developed to ask ECE staff about their current knowledge and understanding of IAQ. The survey was administered online using Qualtrics and contained various question formats, including multiple-choice, Likert scale, and open-ended questions. See Table 1 for a description of the survey items, some adapted from existing scales and others developed specifically for this study.

The survey items were piloted by distributing the survey to 10 individuals with ECE experience. Based on their feedback, adjustments and edits were made to finalize the survey.

The survey link was emailed to the participating ECE teachers who were recruited at professional conferences, and through the state’s childcare registry and ECEI’s existing research-program partnerships.

Table 1			
Survey Component	No. of Qs	Purpose	Types of Questions
Informed consent	1	Understand the study, Know their Rights, and Provide Explicit Consent	Yes/No question
Demographic questions	6	Categorizing Participants, Identifying Patterns, Ensuring Representation, Tailoring Analysis, Controlling for Bias	Multiple-choice question / Open-ended question
Work experience and environment	5	Understanding Professional Background, Analyzing Job-Related Factors, Customizing Feedback, Comparing Groups, Exploring External Influences	Multiple-choice question
Personal health	5	Identify Health Symptoms, Correlate Air Quality with Health, Identify Vulnerable Groups, Evaluate Long-term Health Risks, Support Policy Recommendations	Yes/No question / Multiple-choice question / Likert-scale question
Classroom conditions	9	Assessing Ventilation and Airflow, Identifying Sources of Pollutants, Evaluating Comfort Levels, Understanding Occupancy and Usage Patterns, Linking Environmental Factors to Health Outcomes, Improving Learning and Teaching Environments, Supporting Policy and Infrastructure Changes	Multiple-choice question / Likert-scale question / Open-ended question
Health concerns and existing measures	2	Identifying Specific Health Concerns, Assessing Awareness of Health Risks, Evaluating the Effectiveness of Existing Measures, Exploring Gaps in Protective Actions, Tailoring Future Recommendations, Linking Perceived Risks with Actual Data	Multiple-choice question / Open-ended question
Knowledge and perceptions	9	Assess Awareness Levels, Evaluate Perceptions of Air Quality, Gauge Attitudes Toward Solutions, Identify Behavioral Practices, Inform Education and Intervention Programs, Highlight Perception vs. Reality Gaps, Support Policy Development	Multiple-choice question / Open-ended question
Factors contributing to indoor air quality and solutions	6	Identify Sources of Pollution, Assess the Impact of Building Design, Understand Behavior and Practices, Evaluate Maintenance and Upkeep, Evaluate Current Measures, Identify Gaps and Needs, Gauge Effectiveness, Explore New Solutions, Inform Policy and Recommendations	Multiple-choice question / Open-ended question

RESULTS

Description of the Sample:

Diverse sample:

• 714 total respondents

• 699 female

• 10 male

• 5 other

Varied ages:

• 24% Gen Z (1965-1980)

• 41% Millennials (1981-1996)

• 25% Gen X (1965-1980)

Varied education levels:

• 42% some college

• 24% BA or equivalent

Varied experience and roles:

• 45% employed in ECE 1-4 years

• 60% lead teacher

• 26% assistant teacher

• 28% pre-school staff

• 42% Infant/toddler staff

• 74% worked 40 hours or more per week

IAQ Negatively Impacts Children’s Learning

Importance	Count	Percentage
Not at all important	11	2%
Slightly important	18	3%
Moderately important	73	12%
Very important	232	39%
Extremely important	259	44%

Importance of IAQ For The Health And Well-Being of Teachers

Importance	Count	Percentage
Not at all important	13	2%
Slightly important	18	3%
Moderately important	82	14%
Very important	259	44%
Extremely important	218	37%

Self-Rating of Overall Knowledge of IAQ

Rating	Count	Percentage
Very poor	33	5%
Poor	100	17%
Moderate	267	44%
Good	138	23%
Very good	67	11%

Teachers’ Control of IAQ

Control Method	Count	Percentage
Windows	266	46%
Thermostat	349	60%
A fan	234	40%
An air cleaner	99	17%
Your room door being open or closed	362	62%
Other equipment or devices related to indoor air quality (please specify):	49	8%

Teachers’ Opinion of the Importance of IAQ For The Health of Children

Opinion	Count	Percentage
Yes	468	78%
No	18	3%
Unsure	73	12%

Teachers’ Grades for IAQ In Their Classrooms

Grade	Count	Percentage
Very poor	16	3%
Poor	53	9%
Neutral	226	37%
Good	191	32%
Very good	119	20%

Formal Training on IAQ

Training Level	Count	Percentage
Not at all	412	68%
To a small extent	105	17%
To a moderate extent	55	9%
To a large extent	18	3%
To a very large extent	12	2%

Programs’ Effects to Improve IAQ

Program	Count	Percentage
Regular indoor air quality testing	91	15%
Use of air purifiers or filters	200	33%
Frequent cleaning and maintenance of HVAC systems	196	32%
Use of low-emission cleaning products	94	16%
None that I am aware of	257	43%
Other (please specify):	16	3%

CONCLUSIONS AND IMPLICATIONS

- Although IAQ is viewed as important, only 34% of the respondents said their IAQ knowledge was “good” or “very good.”
- Although the vast majority (80%) view IAQ as “important” or “very important”, 68% reported no training on the topic.
- Most teachers report IAQ is important, but 37% report “rarely” or “never” think about it, potentially indicating this is perceived by teachers as being outside their role.

Teachers’ Concerns

• Lack of air circulation 10.39%

• Too warm 13.45%

• Smell of cleaning supplies 9.82%

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