

Assessment of Nutrition Competency of Graduating Agriculture Students in Ethiopia: A Cross-sectional Study

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ABSTRACT

Objective: To assess the level of nutrition-sensitive agriculture competencies of graduating midlevel animal and plant sciences students in Ethiopia and identify factors associated with the attainment of competencies.

Design: A cross-sectional study design using structured skills observation checklists, objective written questions, and structured questionnaires was employed.

Setting: Two agriculture technical vocational education and training colleges in the 2 regions of Ethiopia.

Participants: A total of 145 students were selected using stratified random sampling techniques from a population of 808 students with the response rate of 93%.

Main Outcome Measures: Nutrition-sensitive agriculture competency (knowledge and skills attributes) of graduating students.

Analysis: Bivariate and multivariable statistical analyses were used to examine the association between the variables of students' gender, age, department, institutional ownership, and perception of learning environment and their performance in nutrition competency.

Results: Combined scores showed that 49% of students demonstrated mastery of nutrition competencies. Gender and institutional ownership were associated with the performance of students ($P < .001$); male students and students at a federal institution performed better.

Conclusions and Implications: The study showed low performance of students in nutrition competency and suggested the need for strengthening the curriculum, building tutors' capacity, and providing additional support to female students and regional colleges.

Key Words: agriculture, curriculum, nutrition assessment, malnutrition, vocational education, competency (*J Nutr Educ Behav.* 2016; ■:1-9.)

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INTRODUCTION

Despite considerable progress in reducing hunger globally, an estimated 795 million people remain chronically malnourished.¹ Globally, 5.9 million children aged <5 years died in 2015 and about 45% of all child deaths are linked to malnutrition.² According to a United

Nations Children's Fund–World Health Organization–World Bank child malnutrition estimate, in 2014 more than one third of all stunted children aged <5 years lived in Africa, where the number of stunted children increased by 23% since 1990.³ In Ethiopia, the 2014 Mini Demographic and Health Survey revealed that despite a substan-

tial decline over the past 15 years, for all children aged <5 years, 40% were stunted, 9% were wasted, 25% were underweight, and 3% were obese or overweight.⁴

Remediation of the underlying causes of malnutrition requires action by different sectors, not just the health sector. The agriculture sector should be one of the key nutrition stakeholders in efforts to reduce malnutrition because it is responsible for ensuring food security.⁵ However, evidence shows that whereas most agricultural interventions improve food security through increased food production, these interventions do not guarantee nutritional security unless they also diversify food production and consumption.⁶

To overcome the problem of malnutrition in Ethiopia, the government's

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national nutrition program includes nutrition-specific interventions that target adequate food intake and nutrient supplementation and nutrition-sensitive interventions. Nutrition-sensitive interventions focus on diversifying agricultural products, reducing post-harvest loss, and promoting homestead gardening and food-based approaches.⁷ According to the Food and Agriculture Organization,⁸ nutrition-sensitive agriculture puts nutritionally rich foods, dietary diversity, and food fortification at the heart of overcoming malnutrition and micronutrient deficiencies. Nutrition-sensitive interventions that invest extensively in human resources, especially in nutrition education, have a greater possibility of effecting positive nutritional change.^{6,9-12} Given the shortage of trained nutrition service providers in countries affected by a high burden of stunting, increasing the number of trained frontline agriculture and health extension workers is essential to implementing nutrition-sensitive and nutrition-specific interventions.^{9,10,13,14}

Different studies revealed that, despite the demand for a more robust nutrition workforce, in most regions of the world poor-quality training programs translate into delivery of poor-quality nutrition services.^{10,15-17} "Fragmented, outdated, and static curricula that produce ill-equipped graduates"¹⁸ have also contributed to poor-quality nutrition services. Traditional education systems often emphasize instilling knowledge over skills and the desired attitude. Recently, competency-based education garnered a lot of attention globally from policy makers and education reformers.¹⁹ The 2 most common features of competency-based education are (1) a competency framework that is appropriate for the context, and (2) the use of competency assessments that provide clear evidence of graduates' knowledge and ability to do the job.¹⁹ Competence is the quality or state of being functionally adequate or having sufficient knowledge and skill to perform a specific task, action, or function successfully.²⁰

To support nutrition-sensitive agriculture, the Ethiopian government is committed to enhancing the capacity of higher-education institutions to provide high-quality preservice education in nutrition.⁷ The Ethiopian Academy of Science²¹ recommended the

use of agricultural agents to promote nutrition at the household level, especially for children, women, and other vulnerable groups. Agriculture agents assist the farming community to maximize productivity through improved farming systems, increased application of fertilizer, introduction of new varieties and breeds, diversification of crops, and reduction of post-harvest loss, with the goal of positively affecting nutrition. However, there is no documentation regarding the current level of nutrition competencies of agriculture graduates in Ethiopia.

Through its Empowering New Generations to Improve Nutrition and Economic Opportunities (ENGINE) project, the US Agency for International Development is supporting the government of Ethiopia to enhance the capacity of selected agriculture technical vocational education and training (ATVET) colleges to provide high-quality nutrition education in response to the local labor market's requirements.²² To produce graduates who are competent in nutrition-sensitive agriculture practices, in December, 2012, core nutrition competencies were integrated into 14 courses in the plant and animal science departments (7 courses for each discipline, including Promotion of Safe Handling, Storage, Transportation and Preservation of Agricultural Food Products [plant and animal science]; Establishing Diversified Horticultural Crops; Animal Production and Marketing Management; and Handling and Processing of Milk). Courses from both departments' curricula were selected based on their nutrition-sensitive agriculture content. Plant and animal science students who were enrolled at ENGINE-supported institutions in September, 2012 and after passed through the revised curricula as part of a 3-year academic program designed to produce midlevel agriculture development agents.

To understand the gap between labor market requirements and graduates' competencies, this study assessed the nutrition-sensitive agriculture competencies of these graduating midlevel agriculture students and identified factors associated with their nutrition competency. The study also explored students' perception of their learning environment and the adequacy of their experience in preparing them to promote nutrition-sensitive

agricultural practices and reduce malnutrition in Ethiopia.

METHOD

Study Design

The researchers employed a cross-sectional quantitative study design using structured questionnaires to assess the nutrition competency of students from 2 ATVET colleges in Ethiopia. The study used a stratified random sampling technique to create homogeneous subgroups to measure the competency level of plant and animal sciences students who assisted in the promotion of diversified agricultural production and consumption.

Study Population and Study Site

The study population included all 808 prospective 2015 graduating students of plant and animal science from 2 ENGINE-supported ATVET colleges located in Oromia and Southern Nation, Nationality and People Regions in Ethiopia. The study included Level III and Level IV plant and animal science students who were enrolled at the colleges for 2–3 years, and who expected to graduate at the diploma level to serve the community as frontline agriculture agents.

Sample Size and Sample Selection Procedures

A representative sample size was calculated using the assumptions for a 95% level of confidence, maximum variability of attributes related to the level of nutrition competency with a proportion of 0.5 (because there was no previous estimate of agricultural nutrition competency), a design effect of 1 because all target colleges were included in the study, an anticipated nonresponse rate of 10%, and $\pm 15\%$ relative errors (7.5% absolute margin of error). This resulted in an adjusted sample size of 156 animal and plant science graduating students. The adjusted sample size was allocated proportionally to each department (animal and plant science) using total prospective graduates (319 for animal science and 489 for plant science). This gave a sample size of 62 animal science graduating students and 94 plant science graduating students. In

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