correlated with either one or two subscale scores. Particularly encouraging is the fact that five courses were required at all or most community colleges and one course is required at two-thirds of the community colleges. This is an indication that students are likely to experience a wide range of learning opportunities on health and wellness.

Cluster Analysis Results

Whether some combination of faculty-related predictor variables accounted for differences in faculty ratings of the health and wellness indicators was ascertained by K-means cluster analysis (Alsabti et al., 1997). This type of analysis assigns participants to two or more groups where between-group differences are maximized by the distances between the partitioned groups on predictor variables. Two, three, and four group clustering analyses were computed. The best solution was a two-group partitioning involving seven of the predictor variables.

Table 9 shows the between-group differences that best explained group membership. Whereas Group 1 had significantly more years of formal education, Group 2 had significantly higher mean scores on all the other predictor measures. The Group 2 faculty, on average, taught more classes, used more active student and instructor teaching methods, and had more expertise in health and wellness. For purposes of categorizing the two groups, Group 1 can be considered **experienced faculty** whereas Group 2 can be considered **highly experienced faculty**.

Table 9
K-Means Cluster Analysis Results Partitioning the Faculty into Two Subgroups

	Group 1 (N = 45)		Group 2 (N = 21)			
Predictor Variables	Mean	SD	Mean	SD	*F*-Test	*p*-value
Highest Degree Attained	2.98	.62	2.62	.74	4.22	.044
Faculty Special Expertise	0.22	0.42	0.52	0.51	6.40	.014
Number of Courses Taught	3.33	1.56	8.24	1.61	139.69	.000
Methods Courses Taught	1.40	1.07	4.10	1.04	91.68	.000
Field Placement Courses	0.53	0.51	1.52	1.03	27.71	.000
Student-Directed Learning	1.89	1.05	2.43	0.75	4.48	.038
Instructor Demonstrations	0.73	0.99	1.24	1.04	3.61	.062

The means and standard deviations, between-group *F*-tests, and Cohen's *d* effect sizes for the between-group differences on the five health and wellness subscale scores are shown in Table 10. In all five analyses, the **highly experienced faculty** had larger subscale scores compared to the **experienced faculty**. The between-group differences were all statistically significant and had medium to large Cohen's *d* effect sizes for all five subscale scores (Cohen, 1988). The results indicate that faculty who teach more courses, employ active teaching methods, and have personal expertise and special interests in health and wellness were more likely to indicate that they incorporated more content knowledge and experiences on the infant and child health, nutrition, physical activity, and obesity, and adult wellness indicators constituting the focus of investigation in their coursework compared to less experienced faculty (see Table 1).

Table 10
Between Group Differences on the Health, Nutrition, Physical Activity, and Wellness Summated Scores

	Highly Experienced Faculty		Experienced Faculty				
Health and Wellness Subscales	Mean	SD	Mean	SD	*F*-test	*p*-value	Cohen's *d* Effect Sizes
Infant Health and Nutrition	10.76	2.72	8.16	2.94	11.80	.001	.92
Child Health and Nutrition	10.39	2.00	8.96	2.97	3.53	.065	.57
Child Physical Activity	11.90	1.95	10.51	2.23	6.03	.017	.66
Infant and Child Obesity	11.00	1.79	8.98	2.56	10.62	.002	.92
Adult Wellness	7.10	1.55	6.00	2.16	4.30	.042	.59

Conclusions

Results from the survey of North Carolina Community College Faculty in Early Childhood Education reported in this paper found that one-fourth to one-half of the respondents reported that they included content knowledge and experiences on infant and child health, nutrition, physical activity, and obesity, and adult wellness in the courses they taught either *quite a bit* or *a great deal* (see table 6). Faculty teaching EDU 144 (Child Development I), EDU 153 (Health, Safety, and Nutrition), EDU 234 (Infants, Toddlers, and Twos), and EDU 254 (Music

and Movement for Children) indicated that they included more health and wellness content knowledge and experiences in their courses compared to faculty not teaching these classes. Three of these courses (EDU 144, EDU 153, and EDU 234) were previously identified as having a high probability of including health and wellness content (Dunst et al., 2015), and all three courses are required at all or all but one community college (see Table 2).

Analysis of the faculty-related factors associated with "how much" health and wellness content knowledge and experiences were afforded community college students found that a combination of the number of courses taught, faculty expertise in health and wellness, authentic student learning opportunities, and faculty illustration or demonstration of health and wellness knowledge and practices were associated with greater degrees of health and wellness content knowledge and experience (see Tables 7, 8, and 10). What was perhaps most surprising was the fact that faculty with advanced degrees and those with early childhood degrees did not include more health and wellness content knowledge or experiences compared to faculty with an AA or BA degree or degrees in fields other than early childhood.

The survey results, together with the findings in a previous report (Dunst et al., 2015), directly address the "call for" information about the existing coursework used to teach community college early childhood education students content knowledge and provide them experiences on infant and child health, nutrition, physical activity, and obesity, and adult wellness. Both reports prepared for the North Carolina Institute of Medicine Task Force on Early Childhood Obesity Prevention based on recommendations in *Promoting Healthy Weight for Young Children* (North Carolina Institute of Medicine, 2013) indicate that:

- Coursework identified as having a high likelihood of including health and wellness content knowledge (Dunst et al., 2015) tended to be the same courses that were

associated with faculty reporting the greatest amount of health, nutrition, physical activity, obesity, and wellness coursework content.

- Faculty reported greater amounts of health and wellness content in the courses they taught compared to what was identified in an analysis of coursework descriptions (Dunst et al., 2015). This indicates that faculty, and especially more experienced and knowledgeable faculty (see Table 10), provide students a broader range of opportunities to learn about infant, child, and adult health and wellness than what was surmised from coursework analyses.
- A small number of courses required at all or most community colleges were found to be related to the largest amounts of health and wellness content knowledge and experiences (Table 8). Faculty teaching these courses provide students a wide range of learning opportunities to learn about infant and child health, nutrition, physical activity, and obesity, and adult wellness.
- Although the particular types of health, nutrition, physical activity, obesity, and wellness content (Table 1) that faculty reported including in courses they taught differed somewhat, students were nevertheless afforded considerable opportunities to acquire knowledge and skills on health and wellness.
- Despite the fact that very few field placement courses are required at most community colleges, faculty provided their students experiences to apply content knowledge through student-directed and authentic student learning opportunities.
- Results from the survey indicate that content knowledge and experiences on health and wellness are interspersed throughout a number of different courses, and that students are afforded a range of opportunities to learn about, acquire knowledge, and have student

specific experiences, on infant and child health, nutrition, physical activity, and obesity, and adult wellness.

- Of particular note and importance was the finding related to the influence of faculty expertise (educational backgrounds, work experiences, personal interests, specialized training) on the scope of content knowledge and experience included in courses that particular faculty taught (see Tables 7 and 8). Faculty who had any number of different types of specialized expertise or interests were the same faculty who placed more emphasis on health and wellness content knowledge.

The findings from the survey described in this report, together with the results in the coursework analysis report (Dunst et al., 2015), indicate that certain faculty with certain backgrounds and interests in health and wellness regardless of type of professional degree or discipline find ways of incorporating health, nutrition, physical activity, obesity, and wellness content in the coursework in a number of different ways. The scope of inclusion of health and wellness content knowledge and experience is particularly noteworthy and suggests that about one-third of the survey respondents are very attentive to how students are educated about the importance of health and wellness practices.

References

Alsabti, K., Ranka, S., & Singh, V. (1997). *An efficient k-means clustering algorithm*. Santa Clara, CA: Hitachi America, LTD.

Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment (Quantitative Applications in the Social Sciences No. 17)*. Newbury Park, CA: Sage.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

DeVellis, R. F. (1991). *Scale development: Theory and applications*. Newbury Park, CA: Sage.

Dunst, C. J., & Hamby, D. W. (2012). Guide for calculating and interpreting effect sizes and confidence intervals in intellectual and developmental disabilities research studies. *Journal of Intellectual and Developmental Disability, 37*, 89-99. doi: 10.3109/13668250.2012.673575

Dunst, C. J., Raab, M., Hamby, D. W., & Long, A. L. (2015). *Analysis of North Carolina community college early childhood education coursework on nutrition, health, and physical activity*. Unpublished report prepared for the North Carolina Center for Health and Wellness and the North Carolina Institute of Medicine. Orelena Hawks Puckett Institute. Asheville and Morganton, NC.

Hinkley, T., Teychenne, M., Downing, K. L., Ball, K., Salmon, J., & Hesketh, K. D. (2014). Early childhood physical activity, sedentary behaviors and psychosocial well-being: A systematic review. *Preventive Medicine, 62*, 182-192. doi: 10.1016/j.ypmed.2014.02.007

Jennings, A., McEvoy, S., & Corish, C. (2011). Nutritional practices in full-day-care pre-schools. *Journal of Human Nutrition and Dietetics, 24*, 245-259. doi: 10.1111/j.1365-277X.2011.01153.x

Khan, S. S., & Ahmad, A. (2004). Cluster center initialization algorithm for K-means clustering. *Pattern Recognition Letters, 25*, 1293-1302. doi: 10.1016/j.patrec.2004.04.007

Kreichauf, S., Wildgruber, A., Krombholz, H., Gibson, E. L., Vögele, C., Nixon, C. A. (2012). Critical narrative review to identify educational strategies promoting physical activity in preschool. *Obesity Reviews, 13*(s1), 96-105. doi: 10.1111/j.1467-789X.2011.00973.x

Larson, N., Ward, D., Neelon, S., & Story, M. (2011). *Preventing obesity among preschool children: How can child-care settings promote healthy eating and physical activity?* Princeton, NJ: Robert Wood Johnson Foundation.

North Carolina Community Colleges. (2015a). *Combined course library: Education course information*. Retrieved from https://webadvisor.nccommunitycolleges.edu/WebAdvisor/WebAdvisor?TOKENIDX=2415201781&SS=2&APP=ST&CONSTITUENCY=WB.

North Carolina Community Colleges. (2015b). *Education catalog: Early childhood education*. Retrieved from http://www.nccommunitycolleges.edu/sites/default/files/basic-pages/academic-programs/attachments/education_catalog_16jan2015.pdf.

North Carolina Institute of Medicine. (2013). *Promoting healthy weight for young children: A blueprint for preventing early childhood obesity in North Carolina*. Morrisville, NC: Author.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York: McGraw-Hill.

Spector, P. E. (1992). *Summated rating scale construction: An introduction*. Newbury Park, CA: Sage.

SPSS Inc. (2005). *SPSS 14.0. Statistical package for the social sciences*. Chicago: Author.

Summerbell, C. D., Waters, E., Edmunds, L., Kelly, S. A. M., Brown, T., & Campbell, K. J. (2009). Interventions for preventing obesity in children. *Cochrane Database of Systematic Reviews, 1*.

Appendix A

Coursework Descriptions for Courses Included on the Community College Faculty Survey

EDU 119	**Introduction to Early Childhood Education** This course covers the foundations of the education profession, the diverse educational settings for young children, professionalism and planning developmentally appropriate programs for all children. Topics include historical foundations, program types, career options, professionalism and creating inclusive environments and curriculum responsive to the needs of all children and families. Upon completion, students should be able to design career plans and develop schedules, environments and activity plans appropriate for all children.
EDU 144	**Child Development I** This course includes the theories of child development, needs, milestones, and factors that influence development, from conception through approximately 36 months. Emphasis is placed on developmental sequences in physical/motor, emotional/social, cognitive, and language domains and the impact of multiple influences on development and learning. Upon completion, students should be able to compare/contrast typical/atypical developmental characteristics, explain environmental factors that impact development, and identify strategies for enhancing development.
EDU 145	**Child Development II** This course includes the theories of child development, needs, milestones, and factors that influence development, from preschool through middle childhood. Emphasis is placed on developmental sequences in physical/motor, emotional/social, cognitive, and language domains and the impact of multiple influences on development and learning. Upon completion, students should be able to compare/contrast typical/atypical developmental characteristics, explain environmental factors that impact development, and identify strategies for enhancing development.
EDU 151	**Creative Activities** This course covers planning, creation and adaptation of developmentally supportive learning environments with attention to curriculum, interactions, teaching practices and learning materials. Emphasis is placed on creating and adapting integrated, meaningful, challenging and engaging developmentally supportive learning experiences in art, music, movement and dramatics for all children. Upon completion, students should be able to create, adapt, implement and evaluate developmentally supportive learning materials, experiences and environments.

Appendix A, continued.

EDU 151A	**Creative Activities Lab** This course provides a laboratory component to complement EDU 151. Emphasis is placed on practical experiences that enhance concepts introduced in the classroom. Upon completion, students should be able to demonstrate a practical understanding of the development and implementation of appropriate creative activities.
EDU 152	**Music, Movement, and Language** This course introduces a historical perspective of music and movement and integrates the whole language concept with emphasis on diversity. Emphasis is placed on designing an environment that emphasizes language development through developmentally and culturally appropriate music and movement. Upon completion, students should be able to design an environment that develops language through a music and movement curriculum that emphasizes diversity.
EDU 153	**Health, Safety, and Nutrition** This course covers promoting and maintaining the health and well-being of all children. Topics include health and nutritional guidelines, common childhood illnesses, maintaining safe and healthy learning environments, recognition and reporting of abuse and neglect and state regulations. Upon completion, students should be able to demonstrate knowledge of health, safety, and nutritional needs, safe learning environments, and adhere to state regulations.
EDU 153A	**Health, Safety, and Nutrition Lab** This course provides a laboratory component to complement EDU 153. Emphasis is placed on practical experiences that enhance concepts introduced in the classroom. Upon completion, students should be able to demonstrate a practical understanding of the development and implementation of safe indoor/outdoor environments and nutrition education programs.
EDU 157	**Active Play** This course introduces the use of indoor and outdoor physical activities to promote the physical, cognitive, and social/emotional development of children. Topics include the role of active play, development of play skills, playground design, selection of safe equipment, and materials and surfacing for active play. Upon completion, students should be able to discuss the stages of play, the role of teachers in play, and the design of appropriate active play areas and activities.
EDU 188	**Issues in Early Childhood Education** This course covers topics and issues in early childhood education. Emphasis is placed on current advocacy issues, emerging technology, professional growth experiences, and other related topics. Upon completion, students should be able to list, discuss, and explain current topics and issues in early childhood education.

Appendix A, continued.

EDU 234	**Infants, Toddlers, and Twos** This course covers the unique needs and rapid changes that occur in the first three years of life and the inter-related factors that influence development. Emphasis is placed on recognizing and supporting developmental milestones through purposeful strategies, responsive care routines and identifying elements of quality, inclusive early care and education. Upon completion, students should be able to demonstrate respectful relationships that provide a foundation for healthy infant/toddler/twos development, plan/select activities/materials, and partner with diverse families.
EDU 234A	**Infants, Toddlers, and Twos Lab** This course focuses on practical applications that support the healthy development of very young children by applying principles of quality inclusive early care and education. Emphasis is placed on recognizing the interrelated factors that impact children's development through planning, evaluating and adapting quality environments, including activities and adult/child interactions. Upon completion, students should be able to demonstrate the ability to engage in respectful, responsive care that meets the unique needs of individual children/families
EDU 251	**Exploration Activities** This course covers discovery experiences in science, math, and social studies. Emphasis is placed on developing concepts for each area and encouraging young children to explore, discover, and construct concepts. Upon completion, students should be able to discuss the discovery approach to teaching, explain major concepts in each area, and plan appropriate experiences for children.
EDU 251A	**Exploration Activities Lab** This course provides a laboratory component to complement EDU 251. Emphasis is placed on practical experiences that enhance concepts introduced in the classroom. Upon completion, students should be able to demonstrate a practical understanding of the development and implementation of appropriate science, math, and social studies activities for children.
EDU 254	**Music and Movement for Children** This course covers the use of music and creative movement for children. Topics include a general survey of the basic elements of music and planning, designing, and implementing music and movement experiences for creative learning. Upon completion, students should be able to use voice and various musical instruments to provide musical and movement activities for children.

Appendix A, continued.

EDU 259	**Curriculum Planning** This course is designed to focus on curriculum planning for three- to five-year-olds. Topics include philosophy, curriculum models, indoor and outdoor environments, scheduling, authentic assessment, and planning developmentally appropriate experiences. Upon completion, students should be able to evaluate children's development, critique curriculum, plan for individual and group needs, and assess and create quality environments.
EDU 284	**Early Child Capstone Practicum** This course is designed to allow students to apply skills in a three stars (minimum) or NAEYC accredited or equivalent, quality early childhood environment. Emphasis is placed on designing, implementing and evaluating developmentally appropriate activities and environments for all children; supporting/involving families; and modeling reflective and professional practices. Upon completion, students should be able to demonstrate developmentally appropriate plans/assessments, appropriate guidance techniques and ethical/professional behaviors as indicated by assignments and onsite faculty visits.

Appendix B

Community College Faculty Survey

Survey of North Carolina Community College Faculty In Early Childhood Education

Introduction

Thank you for taking the time to complete our survey on coursework for the Associate in Applied Sciences Degree in Early Childhood Education. The survey should take no longer than 15 to 20 minutes to complete.

The survey includes questions to determine the degree to which early childhood coursework in the early childhood degree program includes content knowledge and experiences on child health, nutrition, obesity, and physical activity and adult wellness. The survey is being conducted in response to a recommendation in ***Promoting Healthy Weight for Young Children*** by the North Carolina Institute of Medicine for "information on curricula used to teach upcoming child care and early education professionals about early childhood health." Your participation is voluntary and only aggregate information for all faculty combined will be used in a report on the survey results.

Please tell us about your professional background

At which community college(s) do you teach?

1. _____

2. _____

3. _____

Please indicate which of the following is the highest degree you have attained.

❑ AA ❑ BS/BA ❑ MA/MS ❑ Ph.D./Ed.D.

❑ Other (Please describe) _____

What is your professional degree/discipline? _____

Courses

Please indicate which of the following courses you currently teach or have taught in the last two years.

❑ EDU 119 ❑ EDU 144 ❑ EDU 145 ❑ EDU 151

❑ EDU 151A ❑ EDU 152 ❑ EDU 153 ❑ EDU 153A

❑ EDU 157 ❑ EDU 188 ❑ EDU 234 ❑ EDU 234A

❑ EDU 251 ❑ EDU 251A ❑ EDU 254 ❑ EDU 259

❑ EDU 284

Please list any other courses you teach that include content knowledge on child health, nutrition, obesity, or physical activity or adult wellness

Course 1 _____

Course 2 _____

Course 3 _____

The following questions ask you to indicate how much content knowledge you include in the courses you teach in five health, physical activity, and wellness areas. Please keep in mind the courses you teach when responding to the survey items. Also keep in mind that no course or even a combination of courses would be expected to include content knowledge on all or even most of the survey items.

Child Physical Activity and Movement

How much content knowledge do you include in any of the courses you teach in each of the following *exercise and movement* topic areas?

Encouraging age-appropriate child movement and exercise to promote healthy development

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Information on how to design outdoor environments (e.g., playgrounds) to encourage child physical activity

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Importance of limiting child TV watching and other screen time (e.g., computers, iPads)

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Child Health and Nutrition

How much content knowledge do you include in any of the courses you teach in each of the following *child health and nutrition* topic areas:

Information on preparing and serving healthy foods and beverages for child consumption

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Information on different methods and strategies for encouraging children to eat healthy foods

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Information on the value of providing children opportunities to grow vegetables and other food for consumption

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Infant Health and Nutrition

How much content knowledge do you include in any of the courses you teach in each of the following *infant health and nutrition* topic areas:

Information on providing first-time parents information and support to encourage breast feeding

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Information on the importance of breastfeeding for promoting healthy child development

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Information on the importance of encouraging appropriate infant sleep patterns (e.g., sleep routines and duration of sleep)

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Infant and Child Obesity

How much content knowledge do you include in any of the courses you teach in each of the following *infant and child obesity* topic areas:

Information for understanding the effects obesity has on hindering healthy child development

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Information on current trends in obesity among infants, toddlers, and preschool aged children

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Information on the importance of recognizing signs that an infant has eaten enough food and encouraging appropriate feeding practices

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Adult Wellness

How much content knowledge do you include in any of the courses you teach in each of the following *adult wellness* topic areas:

Importance of adopting personal wellness practices to provide children and their parents role models for healthy development

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Information for educating parents and other caregivers about weight gain and healthy development

None at All ❑ Just a Little ❑ Some ❑ Quite a Bit ❑ A Great Deal ❑

Teaching Methods

Which of the following teaching methods do you use to promote student understanding and mastery of content knowledge on child health, nutrition, obesity, and physical activity?

- ❑ Classroom lectures
- ❑ Role playing
- ❑ Instructor simulations
- ❑ Student projects
- ❑ Discussion groups
- ❑ Extra readings
- ❑ Field placements
- ❑ Coursework labs
- ❑ Instructor demonstrations
- ❑ Case-method
- ❑ Online assignments
- ❑ Service learning
- ❑ Others (please specify) _____

Faculty Expertise

Please describe any educational background, special knowledge or skills, or expertise you have on child health, nutrition, obesity, or physical activity, or adult wellness.

1. _____
2. _____
3. _____
4. _____
5. _____

Thank you for taking the time to complete our survey.

A copy of the final report will be provided to the head of the Early Childhood Education Department at each community college for distribution to faculty.