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# Occupational Therapy Early Intervention in Indiana and Contiguous States

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## Abstract

**Objective:** This study examined the reasons why a particular discipline is chosen to provide early intervention services within the states of Indiana, Ohio, Illinois, Michigan and Kentucky, the perception of the personnel that determines appropriate disciplines, and the personnel understanding of that discipline's scope of practice.

**Method:** A total of 72 early intervention personnel from Indiana, Ohio, Illinois, Michigan and Kentucky completed an online survey. IRB approval was obtained prior to the initiation of the study.

**Results:** Some determiners of early intervention services perceive an overlap in the services offered by occupational therapy and developmental therapy. Some participants acknowledged that occupational therapy services are underutilized; however, most believed services were utilized appropriately.

**Conclusions:** The perception of occupational therapy and developmental therapy scopes overlapping can result in a lack of referrals to the best discipline for a child's need. Some barriers may exist to receiving occupational therapy in early intervention.

**Keywords:** Early intervention; Occupational therapy; Service utilization; Service integration

developmental delay, or are considered to be environmentally or biologically at risk for a developmental delay.

Early intervention is a result from the Individuals with Disabilities Education Act (IDEA) federal legislation. The IDEA (formerly Education of Handicapped Children Act) was created in 1975 to require public schools to offer services to children with disabilities ages three to twenty-one. These services include, but are not limited to transportation, psychological services, occupational therapy, physical therapy, and speech-language pathology services. Early childhood professionals began researching the benefits of providing interventions to children with developmental delays earlier than three, and Part H of the IDEA was introduced in 1987 [2]. Part H, later renamed Part C, extended the eligibility age range from even before birth to three years of age [2]. Early intervention services present children with experiences that can alter their competency over time [2]. The role of occupational therapy practitioners within these services is to set children on a normative developmental trajectory. In doing so, the child may achieve optimal occupational functioning and performance.

Part C of IDEA outlines guiding principles for states under the early intervention program. However, within statutory limits, each state has developed their own meaning of developmental delays [3]. Additionally, each state has the option to provide early intervention services to infants and toddlers at risk of having developmental delays. Possible services available under early intervention programs include, but are not limited to assistive technology, audiological services, developmental therapy, family education/training/counseling, health services, medical services, nursing services, nutrition services, occupational therapy, physical therapy, psychological services, service coordination, social work services, speech therapy, transportation, and vision services [4].

Occupational therapy plays an important role in most state's early intervention programs. Part C of IDEA focuses on five areas of development: physical, cognitive, communication, social-emotional, and adaptive [5]. With respect to these areas of development, occupational therapists work in early intervention with children, parents, caregivers, educators, and other team members to facilitate the child's ability to engage in meaningful occupations within the environment of the home, day care, and community [5]. These meaningful occupations include activities of daily living (feeding, bathing,

## Introduction

The field of early childhood intervention plays a vital role in the lives of families across the country. Early childhood appertains to the ages between birth and three years of age during which critical developmental periods commence [1]. Intervention refers to the implementation of program services designed to enhance the child's development in their natural environment [1]. These interventions are done in effort to prevent or minimize the physical, cognitive, emotional, and resource limitations of such children [1]. Together, early intervention describes the services for children from birth to three years of ages who have an established risk,

toileting, etc.), play, leisure, and social interactions. For example, an occupational therapist may work with a family of a newborn baby with poor feeding skills. The occupational therapist will provide training and support for the family to enhance the baby's ability to drink from a bottle [5]. In early intervention programs, occupational therapists may act as a service coordinator or manager of an early intervention agency.

## Purpose

First Steps experts of the Indiana Occupational Therapy Association identified a trend concerning the scope of practice. The trend is that Occupational Therapy's range of services is not fully understood. Therefore, this study's purpose is to examine the reasons why a particular discipline is chosen to provide services with a family. It will examine the perception of the personnel that determines which discipline of occupational, physical, speech and/or developmental therapy services are offered and the personnel understanding of that discipline's scope of practice. The resulting information will improve awareness of occupational therapy skills at the state and local level and potentially increase the utilization of occupational therapy as a service of choice in early intervention. With this following information in mind, the following research questions will be addressed:

1. Are the determiners of services aware of the scope of occupational therapy for early intervention?
2. Is the awareness of early intervention occupational therapy impacting utilization of services?
3. Is the utilization of early intervention occupational therapy similar to the contiguous states of Kentucky, Ohio, Michigan, and Illinois?

In summary, this study's purpose is to examine the Service Coordinators and Assessment Team's' perception of the discipline's therapy skills resulting in a determination of whether occupational therapy is under identified as a beneficial service for families within Indiana's First Steps program and early intervention services of contiguous states.

## Review of the Literature

There is not a universal definition of developmental delay under Part C of the IDEA. Therefore, there are varying definitions of developmental delays by state. States are able to follow basic guidelines in order to come up with their own definition. The basic guidelines for eligibility include: measuring cognitive, physical, communication, social, emotional, and adaptive development with "appropriate diagnostic instruments;" and/or a diagnosis that could result in developmental delay. Part C also suggests, but does not enforce, "clinical opinion" to be included to determine if the child has a developmental delay [6].

It is up to the state to determine if they would like to include risk factors, other than just a primary diagnosis, as components to determining whether a child needs services for

a developmental delay. There are two types of risk factors, as mentioned above, outside of a diagnosis: biological risk factors and environmental risk factors. Biological risk factors include medical conditions that could result in a potential delay in development. Examples of biological risk factors include low birth weight and chronic lung disease. Children and family must be assessed by a multidisciplinary team in states that include biological factors as part of the criteria to receive early intervention services [6]. The multidisciplinary team will then compare their assessment results with the State-defined factors.

Environmental risks focus on the caregiver and living conditions of the child that could potentially lead to a developmental delay. Diagnoses and medical conditions are not included in environmental factors. Examples of environmental factors include poverty and education level of the caregivers. Similar to biological factors, a multidisciplinary team must assess the child and family to determine if the environmental risks match the state's criteria for early intervention services. States can also require multiple risk factors to be present in order to receive services [6]. Some states require the presence of multiple biological or environmental factors, or a combination of the two for children to qualify for these health services.

## State disparities

In addition to varying definitions of developmental delay that influence the eligibility to receive services, there are many other factors that differ from state to state. Each state has determined a name for the early intervention program. The names of the early intervention programs for each state in this study are as followed: 1) First Steps (Indiana), 2) First Steps (Kentucky), 3) Early On (Michigan) 4) Help Me Grow (Ohio), and 5) Illinois Early Intervention Program (Illinois). Each state has an organizational structure set in place for the evaluation, determination, and delivery of services; however, this structure is inconsistent among states. Despite inconsistencies, each state is required to have points of contact determined by geographical location, a protocol for the determination of services, personnel in place for service coordination, and personnel in place to develop and implement the Individual Family Service Plan (IFSP). Although the delivery of services is comparable from state to state, the title of personnel may differ. For example, in Indiana, the title of developmental therapy is comparable to title of Early Intervention Specialist in Ohio.

Relative to this study, each state also has varying definitions that determine the scope of occupational therapy. These definitions guide the determiners of services to establish if the child is qualified to receive occupational therapy through the state's early intervention program. Some similarities in the definitions of occupational therapy among states include adaptive skills, sensory needs, and motor skills. There are also some differences among the states. For example, Illinois, Kentucky, and Ohio mention that occupational therapists should address play. Another difference among the definitions is that Indiana is the only state definition that identifies the

occupational therapist should address feeding. The specific state definitions, of occupational therapy, definition of developmental delay required to be eligible to receive

services, and whether or not the state considers risk factors in establishing eligibility can be found below in **Table 1**.

**Table 1** Varying definitions of occupational therapy by state.

State	Definition of OT	Eligibility Policy	Serving At-Risk Population
Illinois	Occupational therapy includes services to address functional needs of children related to adaptive development; adaptive behavior, restoration, and play; and sensory, motor, and postural development.	Criteria to receive OT services require that the child must have at least a 30% or more delay in one or more area of development.	Yes
Indiana	Occupational therapy services develop adaptive and self-help skills with focus on developing skills related to sensory-motor integration, coordination of movement, fine motor skills, self-help skills (including feeding), and may include adaptive devices or equipment to help the child in these activities.	Criteria to receive OT services require that the child must have a 25% or 2 standard deviations from the mean in one or more developmental domains; or 20% or 1.5 standard deviations from the mean in two or more developmental domains.	No
Kentucky	Occupational therapy services address the functional needs of a child related to adaptive development, adaptive behavior and play, as well as sensory, motor, and postural development.	Criteria to receive OT services require that the child must have 2 standard deviations below the mean in 1 domain of development or skill area or 1.5 standard deviations below the mean in 2 domains of developmental or skill areas.	No
Michigan	Occupational therapy provides services that improve a child's fine and gross motor skills, visual perception and their ability to perform everyday activities including bathing, dressing and eating.	Criteria to receive OT services require that the child must have a delay of 20% or 1 standard deviation below the mean in 1 or more developmental domains.	No
Ohio	Occupational therapy services address the functional needs of an infant or toddler with a disability related to adaptive development, adaptive behavior, and play, sensory, motor, and postural development. Additional services include adaptation of the environment and selection, design, and fabrication of assistive and orthotic devices.	Criteria to receive OT services require that the child must be functioning at 1.5 standard deviations below the mean or more in at least 1 of the developmental domains.	No
Note: eligibility policy [7]			

## Methodology

This study used a survey design. For content validity of the instrument, First Steps experts from Indiana reviewed the survey developed for this study. An invitation email, along with an informed consent form was sent to early intervention coordinators and eligibility determination teams for the states of Indiana, Ohio, Kentucky, Illinois, and Michigan. Returned consent forms were witnessed by investigators, then stored in a secured file cabinet. Once a participant consented, a link to the survey was provided to the early intervention coordinators and assessment teams. The Indiana University Institutional Review Board (IRB) approved this study in July 2015.

## Participants

The participants of this study consist of the Intake and Service Coordinators and Eligibility Determination Teams at the Systems Point of Entry Offices and Service Coordinators or equivalent for the states of Indiana, Ohio, Kentucky, Illinois and Michigan. Potential survey respondents were selected from contacts for the intake and service coordinators provided on Indiana and contiguous states online program websites. Inclusion criteria includes individuals who are currently employed or contracted with an early intervention organization that determines services, willing to provide informed consent, and willing to complete a survey. SurveyMonkey's privacy policy ensures that all surveys are

kept private, data is held securely, and all respondent emails are safeguarded. All responses to the survey are kept anonymous and the data will be used only for the purpose of this study.

## Survey tool

The investigators developed the survey tool and First Steps experts reviewed the survey. After being endorsed by all, it was placed in a web-based survey platform called SurveyMonkey. The survey consists of sections requesting (a) demographic information, (b) how often occupational therapy services are referred, (c) how the participants define what skills are provided by occupational, physical, speech, and developmental therapies, (d) if the participant believes occupational therapy services are accurately utilized, and (e) perceptions of service integration. The 15 questions were grouped into a total of six pages with an estimated time of 10 minutes for completion. Demographic information consists of identification of discipline, years of practice, and counties served. Participants define the varying services by matching professions with given definitions. Service integration perceptions are also examined. A service integration perception question involves hypothetical service referrals based upon specific delays and matching those scenarios with appropriate disciplines. Five survey instruments were developed, one for each specific state. These forms differed only in the state in which they are intended to be sent.

## Survey procedure

Four emails were sent to potential participants: (1) an initial email requesting participation, a description of the study, and describing the consent form with instructions, (2) an email containing a link to the survey upon receipt of the consent form, (3) a follow-up email reminder and (4) a final follow-up email reminder requesting participation and thanking those who had participated.

## Data analysis

The web-based SurveyMonkey tool collected responses and the investigators analyzed the results using the analysis tool within SurveyMonkey. The analysis tool within SurveyMonkey provided summaries of each individual survey question. The survey responses were further filtered and compared to allow

focus on specific subsets of data. The research questions for this study were: (1) are the determiners of services aware of the scope of occupational therapy for early intervention; (2) is the awareness of early intervention occupational therapy impacting utilization of services; and (3) is the utilization of early intervention occupational therapy similar to the contiguous states of Kentucky, Ohio, Michigan, and Illinois? In order to answer these questions, the researchers further examined the results, specifically looking at survey items seven, eight and twelve to answer research question one and survey items nine, ten and eleven to answer research question two. Research question three was answered through comparison of the contiguous state's survey responses.

## Results

**Table 2** Participant characteristics as a percentage of the sample.

Characteristics	Indiana (n=38)	Illinois (n=2)	Kentucky (n=4)	Michigan (n=11)	Ohio (n=17)	Total (n=72)
<b>Profession</b>						
Administrator	2.63	0	25	36.36	52.94	18.75
DT	2.63	0	0	0	17.65	5
Nurse	0	0	0	0	17.65	3.75
OT	7.89	0	25	27.27	11.76	11.25
PT	2.63	0	0	9.09	0	2.5
SLP	7.89	0	0	0	0	3.75
Other *	78.95	100	75	36.36	29.41	55
<b>Years of Practice</b>						
0 - 5	21.05	50	25	45.45	29.41	27.78
6 - 10	21.05	0	25	0	5.88	13.89
11 - 15	21.05	0	0	18.18	11.76	16.67
16 - 20	13.16	50	25	0	23.53	15.28
21+	23.68	0	25	36.36	29.41	26.39
<b>Education Level</b>						
Bachelor's	63.16	50	0	36.36	52.94	52.05
Master's	23.68	50	75	63.63	35.29	35.62
Doctoral	0	0	25	0	0	1.37
Professional	0	0	0	0	0	0
Other **	15.79	0	0	0	11.76	10.96
<b>Note:</b> *Other responses included Service/Intake coordinator, Case Manager, Service Coordinator Team Manager, Systems Specialist, Assistant Director, Parent Liaison in EI, EI Program Manager, Evaluation Specialist, Social Worker, Early On Coordinator, Early Childhood Special Education Teacher, Developmental Specialist, and Regional Infant Hearing Program Parent Advisor. **Other responses included Some College Courses, No Degree (personal experience), Post BS Certificate, CDA, Associate's Degree of Nursing, HS, and 12+ Some College						

There were 130 participant e-mails sent. A total of 84 consent forms and 72 completed surveys were received, giving a 85.71% response rate. Thirty-eight surveys were completed from Indiana, 2 from Illinois, 4 from Kentucky, 11 from Michigan, and 17 from Ohio. Most respondents selected the

other option concerning profession (55%). A majority of those selecting other, reported their profession as service coordinator. A small majority have practiced between zero to five years (27.78%) and a smaller majority have practiced for greater than twenty-one years (26.39%). The range for years of

practice reported was from six months to forty years. Fifty-two percent of the sample population had a Bachelor's degree (52.05%). Just over one-third of the respondents had a Master's degree. A breakdown of participant characteristics as a percentage may be found in **Table 2**.

## Indiana results

**Research question 1 (survey items 7, 8, 12):** Item seven on the survey tool requested participants to accurately match the profession (Developmental Therapy, Occupational Therapy, Physical Therapy, and Speech Language Pathology) with the definition provided by Family and Social Services Administration on Indiana Early Intervention online website (<http://www.in.gov/fssa/ddrs/4653.htm>). Respondents were given the option to choose more than one profession for each definition. Most respondents matched the professions with the most accurate definition; however, some respondents believed the definitions could fit multiple professions. For example, for the definition that best fits Developmental Therapy, there were thirty-six responses matching the definition with Developmental Therapy, four responses matching it with Occupational Therapy, three responses matching it with Speech Therapy, and three responses matching it with Physical Therapy. The description of results for this question can be found in **Table 3**.

Item eight on the survey asked respondents to select the services occupational therapy offers in early intervention. All Indiana respondents believed that occupational therapy addresses fine motor and perceptual skills, as well as sensory integration. In addition, 97.3% reported occupational therapy addresses feeding and swallowing. Three respondents also chose that occupational therapy addresses "other" areas, and commented that occupational therapy in early intervention addresses "upper body strengthening, adaptive skills," "improved play skills, adaptive skills," and "motor planning, daily routine skills".

The twelfth item on the survey presented the respondent with six scenarios and asked the respondent to identify which profession would be most appropriate for each scenario. Each scenario was determined by an early intervention expert to warrant occupational therapy services, but the scenarios were not exclusive to OT. Of the six scenarios, five were deemed most appropriate for an occupational therapist to address. The only scenario in which occupational therapy was not the majority answer was the following: A 24-month-old child challenged by muscle tightness all of their body. Caregiver having problems with dressing and toileting. For this scenario, twenty-eight respondents believed occupational therapy should address this. Thirty-five respondents believed Physical Therapy should address this scenario. **Table 4** further presents the results of this particular item on the survey.

**Research question 2 (survey items 9, 10, 11):** The ninth item on the survey addressed how frequently occupational therapy services are referred in Indiana early intervention. Of the Indiana respondents, 29.73% determined that they made referrals for occupational therapy 0-3 times per month. About thirty-five percent of respondents reported making referrals

4-6 times per month. One respondent (2.7%) reported making referrals to occupational therapy 7-9 times per month. About eight percent of respondents reported making occupational therapy referrals 9+ times per month. Nine respondents (24.32%) reported making referrals was not applicable.

The tenth and eleventh survey items addressed whether or not the respondents believed occupational therapy services are utilized appropriately, and, if not, why they believed they were not utilized appropriately. Nearly all respondents reported that they believed occupational therapy services were utilized appropriately in early intervention (91.89%). Three individuals (8.11%) reported occupational therapy services were not utilized appropriately. One respondent (2.7%) was undecided. Two respondents who did not believe occupational therapy services were utilized appropriately in early intervention commented on occupational therapy being under-utilized in the area of sensory processing. One respondent commented on occupational therapy being under-utilized due to the lack of occupational therapists available in the area where the infant or child lives.

## Ohio and Illinois

**Research question 1 (survey items 7, 8, 12):** All respondents from Ohio and Illinois accurately matched the profession and its definition on survey item seven. Some respondents from Ohio and Illinois marked multiple professions meet a specific definition. For example, one respondent from Illinois matched Developmental Therapy, Occupational Therapy, and Physical Therapy with the definition: focuses on developing skills related to sensory-motor integration, coordination of movement, fine motor skills, self-help skills, and may include adaptive devices. Additionally, one respondent from Ohio matched those professions and speech therapy with the same definition above. A further breakdown survey item 7 responses may be found in **Table 3**.

When asked to select the services occupational therapy offers to infants and children in early intervention (survey item 8), all respondents from Ohio believe occupational therapy addresses fine motor/visual motor perceptual skills and sensory integration. Eighty-two percent of Ohio respondents reported occupational therapy address feeding and swallowing. Approximately eighteen percent of Ohio respondents selected the other response identifying self-help, social/emotional, behavior, gross motor, cognitive, play skills and adaptive equipment. All respondents from Illinois believe occupational therapy addresses fine motor/visual motor perceptual skills and sensory integration. Exactly one-half of the Illinois respondents believe that occupational therapy addresses feeding and swallowing.

Survey item twelve involved perceptions of service integration by asking respondents to determine which profession is most appropriate for six different scenarios. After an accumulation of data, Ohio respondents selected one out of the six clinical scenarios as most appropriate for occupational therapy. They also selected occupational therapy and developmental therapy as most appropriate for two of the six scenarios. Ohio respondents selected physical therapy as

most appropriate for two of the six scenarios and speech therapy as most appropriate for one of six scenarios. Illinois respondents selected one of the scenarios as most appropriate for occupational therapy. Occupational therapy and physical therapy were both selected as most appropriate for one of the six scenarios and occupational therapy, developmental therapy, and speech therapy were all selected as most appropriate for one of the six scenarios. Illinois respondents selected developmental therapy as most appropriate for two of the six scenarios and speech therapy as most appropriate for one of the two scenarios. A further breakdown of survey item 12 may be found in **Table 4**.

**Research question 2 (survey items 9, 10, 11):** When asked to report frequency of referrals for occupational therapy services (survey item 9), approximately thirty-five percent of Ohio respondents report referring for occupational therapy services 0-3 times per month. Twenty-nine percent of Ohio respondents report referring for occupational therapy service 4-6 times a month and twelve percent report referring for occupational therapy services greater than nine times per month. The remainder of the respondents reported that this question as not applicable. Exactly one-half of the Illinois respondents report referring for occupational therapy services greater than nine times per month and the remaining half reported that this question as not applicable.

Survey item 10 and 11 asked respondents whether they believe occupational therapy services are utilized appropriately in early intervention services and if no, why not. Seventy-six percent of Ohio respondents and all Illinois respondents believe that occupational therapy services are being accurately utilized in early intervention services. The remaining twenty-four percent of the Ohio respondents reported that occupational therapy services are not being accurately utilized. Several of the respondents from Ohio who selected "no" commented that occupational therapy's scope of practice is not fully understood. For example, one respondent from Ohio replied that "many other professionals do not understand the breadth of OT services and the complete skills set of an occupational therapist."

## Kentucky and Michigan

**Research question 1 (survey items 7, 8, 12):** Three out of four respondents from Kentucky matched occupational therapy with its most accurate definition (survey item 7), as the remaining participant matched developmental therapy with the occupational therapy definition. All four respondents also matched occupational therapy with the developmental therapy definition. For Michigan, all participants accurately matched occupational therapy with its definition. One or more participants also matched developmental, speech, and physical therapy with the definition of occupational therapy, believing that this definition may apply to more than one profession. **Table 3** shows a detailed breakdown of survey item 7 responses.

When asked what services occupational therapy offers in Early Intervention (survey item 8), all four Kentucky participants and 10 out of 11 Michigan participants indicated

fine motor/ visual perceptual skills, feeding and swallowing, and sensory integration. One Kentucky participant indicated neuromusculoskeletal and motor learning as additional skills offered by the profession. Other responses from Michigan participants included development of self-help skills and development across all domains. One Michigan participant responded that while he/she believes occupational therapy offers all of the services mentioned, only fine motor services are offered by occupational therapy in his/her county serviced.

Survey item 12 instructed participants to determine what professions were appropriate for 6 different scenarios provided. All Kentucky participants indicated 5 out of 6 scenarios as being appropriate for occupational therapy services, with 3 participants believing the remaining scenario would benefit from OT services. All Michigan participants believed 2 of the 6 scenarios were appropriate for occupational therapy and 9 participants believed the remaining 4 scenarios would benefit from the profession. A further breakdown of survey item 12 may be found in **Table 4**.

**Research question 2 (survey items 9, 10, 11):** Survey item 9 asked participants to report how frequent referrals were made for occupational therapy. Kentucky responses included one participant reporting 0-3 times a month, one participant reporting 4-6 times a month, and 2 participants selecting "not applicable". For Michigan, four participants reported referrals being made 0-3 times a month, one reported 4-6 times a month, and one reported 7-9 times a month. Five participants selected "not applicable". When asked if Kentucky participants believed occupational therapy services were utilized appropriately in early intervention (survey item 10), two reported yes, one reported no, and one was undecided. The participant who reported that occupational therapy services are not utilized appropriately stated that there is a shortage of occupational therapists in the area.

Nine of eleven Michigan participants believe occupational therapy services are utilized appropriately in early intervention, one participant believes services are not utilized appropriately, and one participant selected undecided. Michigan responses for why occupational therapy services are not used appropriately included: "...again, I feel we do not provide interventions early enough for children 0-3. In our county, occupational therapy is an ancillary service that has to be tied to an ECSE teacher and many times, the ECSE teacher is the provider" and "...only issue is that occupational therapy cannot stand alone for special education eligibility. Need medical diagnosis or other early intervention service to be able to qualify for occupational therapy services".

## Summary

**Research question 3:** The summary of results will assist in answering the third research question, "Is the utilization of early intervention occupational therapy similar to the contiguous states of Kentucky, Ohio, Michigan, and Illinois?" This section further compares each state's responses for the survey questions. For the question that addressed the definitions of each early intervention discipline, most

individuals from each state in this study matched occupational therapy with the correct definition (survey item 7).

**Table 3** Survey item 7 results: matching the profession with its definition as a percentage.

State Responses	Focuses on developing skills related to sensory-motor integration, coordination of movement, fine motor skills, self-help skills, and may include adaptive devices.	Focuses on receptive and expressive communication. May include the use of sign language, augmentative communication devices or other assistive devices	Focuses on promoting development. This may include designing learning environments and activities to promote development across all domains: cognitive; physical; communication; social/emotional; and adaptive	Focuses on gross motor skills and the ability to move and effectively use his/her arms, legs, trunk and head
<b>Indiana</b>				
DT	1 (2.70%)	3 (8.11%)	36 (97.30%)	1 (2.70%)
OT	37 (100%)	2 (5.41%)	4 (10.81%)	1 (2.70%)
PT	1 (2.70%)	0 (0.00%)	3 (8.11%)	37 (100%)
ST	0 (0.00%)	37 (100%)	3 (8.11%)	0 (0.00%)
<b>Ohio</b>				
DT	4 (23.53%)	4 (23.53%)	17 (100%)	5 (29.41%)
OT	17 (100%)	1 (5.88%)	3 (17.65%)	2 (11.76%)
PT	2 (11.76%)	1 (5.88%)	2 (11.76%)	17 (100%)
ST	2 (11.76%)	17 (100%)	2 (11.76%)	1 (5.88%)
<b>Illinois</b>				
DT	2 (100%)	1 (50%)	2 (100%)	1 (50%)
OT	2 (100%)	1 (50%)	2 (100%)	1 (50%)
PT	2 (100%)	1 (50%)	1 (50%)	2 (100%)
ST	1 (50%)	2 (100%)	1 (50%)	0 (0.00%)
<b>Kentucky</b>				
DT	1 (25%)	0 (0.00%)	4 (100%)	0 (0.00%)
OT	3 (75%)	0 (0.00%)	0 (0.00%)	0 (0.00%)
PT	0 (0.00%)	0 (0.00%)	0 (0.00%)	4 (100%)
ST	0 (0.00%)	4 (100%)	0 (0.00%)	0 (0.00%)
<b>Michigan</b>				
DT	3 (27.27%)	3 (27.27%)	10 (90.91%)	3 (27.27%)
OT	11 (100%)	2 (18.18%)	4 (36.36%)	3 (27.27%)
PT	2 (18.18%)	1 (9.09%)	3 (27.27%)	10 (90.91%)
ST	1 (9.09%)	10 (90.91%)	3 (27.27%)	1 (9.09%)
<b>Total</b>				
DT	11 (15.28%)	11 (15.28%)	69 (95.83%)	10 (13.89%)
OT	70 (97.22%)	6 (8.33%)	13 (18.06%)	7 (9.72%)
PT	7 (9.72%)	3 (4.17%)	9 (12.5%)	70 (97.22%)
ST	4 (5.56%)	70 (97.22%)	9 (12.5%)	2 (2.78%)
<b>Note:</b> There was a total of 72 respondents from Indiana and the contiguous states. Respondents could select all profession they believe matched the profession				

**Table 4** Survey item 12 responses: perceptions of service integration as a percentage.

State Responses	A 14-month-old child challenged by using eating utensils and sippy cups	A 19-month-old child challenged by constant running, climbing, screaming, poor sleeping and throwing things	A 24-month-old child challenged by muscle tightness all over their body. Caregiver having problems with dressing and toileting	A 30-month-old child challenged by banging their head against walls	An 18-month-old child challenged by Down Syndrome	A 10-month-old child challenged by chewing, swallowing and diet progression
<b>Indiana</b>						
DT	18 (47.37%)	28 (73.68%)	4 (10.53%)	22 (57.90%)	34 (89.47%)	1 (2.63%)
OT	37 (97.37%)	35 (92.11%)	28 (73.68%)	34 (89.47%)	37 (97.37%)	36 (94.74%)
PT	0 (0.00%)	2 (5.26%)	35 (92.11%)	0 (0.00%)	36 (94.74%)	0 (0.00%)
ST	6 (15.79%)	2 (5.26%)	0 (0.00%)	7 (18.42%)	34 (89.47%)	26 (68.42%)
<b>Illinois</b>						
DT	1 (50%)	2 (100%)	1 (50%)	2 (100%)	2 (100%)	1 (50%)
OT	2 (100%)	1 (50%)	2 (100%)	1 (50%)	2 (100%)	1 (50%)
PT	0 (0.00%)	1 (50%)	2 (100%)	0 (0.00%)	1 (50%)	0 (0.00%)
ST	1 (50%)	1 (50%)	0 (0.00%)	2 (100%)	2 (100%)	2 (100%)
<b>Kentucky</b>						
DT	2 (50%)	4 (100%)	2 (50%)	3 (75%)	4 (100%)	2 (50%)
OT	4 (100%)	4 (100%)	3 (75%)	4 (100%)	4 (100%)	4 (100%)
PT	0 (0.00%)	1 (25%)	4 (100%)	0 (0.00%)	4 (100%)	0 (0.00%)
ST	2 (50%)	0 (0.00%)	1 (25%)	2 (50%)	4 (100%)	4 (100%)
<b>Michigan</b>						
DT	4 (36.36%)	8 (72.73%)	4 (36.36%)	8 (72.73%)	8 (72.73%)	3 (27.27%)
OT	10 (90.91%)	9 (81.82%)	9 (81.82%)	9 (81.82%)	10 (90.91%)	9 (81.82%)
PT	2 (18.18%)	4 (36.36%)	10 (90.91%)	2 (18.18%)	10 (90.91%)	2 (18.18%)
ST	5 (45.45%)	2 (18.18%)	1 (9.09%)	4 (36.36%)	10 (90.91%)	9 (81.82%)
<b>Ohio</b>						
DT	15 (88.24%)	14 (82.35%)	13 (76.47%)	15 (88.24%)	16 (94.12%)	13 (76.47%)
OT	17 (100%)	14 (82.35%)	15 (88.24%)	15 (88.24%)	16 (94.12%)	15 (88.24%)
PT	1 (5.88%)	4 (23.53%)	17 (100%)	2 (11.76%)	17 (100%)	1 (5.88%)
ST	9 (52.94%)	3 (17.65%)	2 (11.76%)	3 (17.65%)	16 (94.12%)	16 (94.12%)
<b>Total</b>						
DT	40 (55.56%)	56 (77.78%)	24 (33.33%)	51 (70.83%)	64 (88.89%)	20 (27.78%)
OT	70 (97.22%)	63 (87.50%)	57 (79.17%)	63 (87.50%)	69 (95.83%)	65 (90.28%)
PT	3 (4.17%)	12 (16.67%)	68 (94.44%)	4 (5.56%)	68 (94.44%)	3 (4.17%)
ST	23 (31.94%)	8 (11.11%)	4 (5.56%)	18 (25%)	66 (91.67%)	57 (79.17%)
<b>Note:</b> Bold numbers indicate the most appropriate profession for the clinical scenario based on an accumulation of data						

However, since it was possible to mark multiple disciplines with a single definition, it was found individuals from each state marked multiple disciplines for the definition of occupational therapy, with developmental therapy being the second most marked discipline for the correct definition of occupational therapy (Table 3).

Regarding the services offered by occupational therapists, all of each state's respondents believed that occupational therapy addresses fine motor and perceptual skills, as well as sensory integration with the exception of Michigan (10/11 respondents indicated fine motor and perceptual skills, 10/11 respondents indicated sensory integration). In Indiana, 97% of



respondents believed occupational therapy addresses feeding and swallowing, compared to 100% of respondents in Kentucky, 90% of respondents in Michigan, 82% of respondents in Ohio, and 50% of respondents in Illinois. In addition, one respondent from Indiana and one respondent from Ohio similarly identified occupational therapy as addressing “play skills”. One respondent from Michigan and one respondent from Kentucky identified “motor learning” as an area occupational therapy addressed. One respondent from Michigan and one respondent from Ohio identified “self-help skills” as an area occupational therapy addresses. Two respondents from Indiana wrote in “adaptive skills” for this survey item, as well.

For the scenario addressing a child “challenged by constant running, climbing, screaming, poor sleeping and throwing things,” Indiana and Michigan were the only states to indicate occupational therapy as the outright most appropriate discipline. Kentucky and Ohio respondents equally indicated developmental therapy and occupational therapy would best fit the scenario, while both Illinois respondents indicated developmental therapy would be most appropriate. For the scenario in which the child has muscle tightness causing challenges with dressing and toileting, the majority of Indiana, Kentucky, and Michigan respondents indicated physical therapy would best address these challenges. Illinois respondents equally believed occupational therapy and physical therapy should address these challenges. The majority of Indiana, Kentucky, and Michigan respondents believed occupational therapy would best address the scenario of the child banging their head against the wall. Illinois respondents equally marked occupational therapy and speech therapy for this situation, and Ohio respondents equally marked developmental therapy and occupational therapy. For the scenario with the child challenged by Down syndrome, Indiana was the only state in which the majority of respondents outright marked occupational therapy as being the most appropriate discipline. Illinois respondents equally marked developmental therapy, occupational therapy, and speech therapy. Kentucky respondents equally marked all four disciplines. The majority of Michigan respondents equally marked occupational therapy, physical therapy, and speech therapy. For the final scenario addressing chewing and swallowing, the majority of Indiana respondents marked occupational therapy as the most appropriate discipline. The majority of Illinois and Ohio respondents indicated that speech therapy would be most appropriately address chewing and swallowing. Kentucky and Michigan respondents most commonly chose occupational therapy and speech therapy as being equally appropriate for this scenario.

For the number of referrals for occupational therapy services per month (survey item 9), the most commonly reported number of referrals per month in Indiana was four to six times per month (35%). For Ohio, the most commonly reported number of referrals per month was zero to three times per month. Fifty percent of Illinois respondents indicated they make occupational therapy referrals nine times or more per month, while the remaining 50% marked “not applicable”. Michigan and Kentucky respondents most commonly reported

this question as not applicable. However, the second most commonly reported number of referrals per month for both Michigan and Kentucky was zero to three times per month.

In each state, the majority of respondents indicated that they believed occupational therapy services are utilized appropriately (Indiana, 92%; Ohio, 76%; Illinois, 100%, Michigan, 82%; Kentucky, 50%). Eight percent of Indiana respondents, 25% of Kentucky, 24% of Ohio, 9% of Michigan, and 0% of Illinois participants believed occupational therapy was not utilized appropriately. For respondents who indicated occupational therapy is not appropriately utilized in Ohio, a common response was that they do not believe the individual’s referring services know the breadth of the scope of occupational therapy. One respondent from Indiana and one from Kentucky indicated they do not believe occupational therapy is appropriately utilized due to a shortage of occupational therapy in certain areas of their states. A common response from Michigan respondents indicated a lack of referrals to occupational therapy due to the utilization of a primary service provider model in that state.

## Discussion

### Research question 1

The results from this study suggests that some determiners of services perceive an overlap in the services offered by occupational therapy and developmental therapy. This discovery proves true in Indiana and shows to be trending that way in the contiguous states even with the limited number of participants in the survey. Because of the overlap, it is possible developmental therapists are being utilized in cases where occupational therapy would be more appropriate and better suited for the client.

This study also found that each state’s Early Intervention programs identified varying scopes of occupational therapy and used different language in the definition of the scope. Since referrals for occupational therapy are influenced by the scope defined by the early intervention programs, it is possible occupational therapy is not being used to the fullest potential. For example, Indiana and Michigan are the only states in this study that outright mention occupational therapists in Early Intervention work with the infant or child on feeding. Another includes Indiana and Ohio stating occupational therapists address assistive devices with children and infants, while the other states do not mention assistive devices.

### Research question 2

The majority of respondents in this study stated that they believed occupational therapy services were appropriately utilized in their state in question. However, a handful of individuals did not believe occupational therapy services were utilized appropriately, which could have implications to current and potential clients of Early Intervention in these states. In Indiana and Kentucky, there was a common theme that occupational therapy was underutilized due to a lack of therapists. In Indiana and Ohio, respondents mentioned there

was a lack of understanding of the breadth of occupational therapy services, especially in the area of sensory processing in Indiana. In Michigan, respondents reported that occupational therapy is an ancillary service, which results in the underutilization of occupational therapy in Michigan.

### Research question 3

Even with the limited number of respondents from the contiguous states, the results of all the contiguous states are showing a trend in the same direction as Indiana. As stated above, the majority of respondents in all five states believe occupational therapy services are being utilized appropriately. Illinois is the only state in which all respondents believed occupational therapy is being utilized appropriately. The other states had 25% or less of respondents who believe it is not being utilized appropriately. Most respondents from all states were able to correctly match the definition of occupational therapy, but all states also had respondents that believed the definition of occupational therapy was also appropriate for other disciplines. This is important to note when discussing utilization of services because if all states hold a similar belief of the definition of each discipline, it helps explain why respondents within each state also answered multiple professions could appropriately treat the same case scenarios (Table 4).

### Study limitations

Limitations were collected throughout the study. One limitation of the study was the lack of reliability of the survey tool (as valid as we could based on expert review). The survey tool used to collect data was designed to address each research question for this study. Since surveys were collected through an online platform, it is possible that there were technical difficulties the researchers were not aware of, potentially limiting the number of respondents. Another limitation was the small sample size, especially with the contiguous states. There were no incentives involved with taking the survey, except for contributing to help fill the gap in knowledge. Another limitation includes the varying backgrounds of respondents, including education level and requirements of their job. Due to the use of a small, regional sample and varying backgrounds of respondents, the results of this study are not generalizable.

### Study strengths

There were several strengths that make the results of this study beneficial to occupational therapy in Early Intervention. One strength of this study is being able to collect the perceptions of the various Early Intervention disciplines among individuals referring services. Another strength of this study is having Early Intervention experts act as mentors to the researchers. The Early Intervention experts in this study were able to provide insight on the referral process, provide suggestions to help create a survey tool best for obtaining meaningful results, and providing contact information for potential respondents across the state of Indiana.

### Clinical implications

The findings of this study have the following implications for the occupational therapy:

- Gaining insight of Early Intervention professionals perceptions of disciplines involved in the EI process creates a better understanding of how such perceptions can impact the occupational therapy referral process and how often referrals are being made.
- Developing a universal definition for occupational therapy within Early Intervention may create a better understanding of what skills occupational therapists can address during EI services. The American Occupational Therapy Association's (AOTA) advocacy of a universal definition creates opportunities for OT professionals to get involved at a federal level.
- Occupational therapy professionals can work with developmental therapists to identify the differences within one another's scope of practice and determine what areas should be addressed by which discipline for greater success of a child receiving EI services.

### Future research

Further studies are warranted to establish construct validity and reliability of the survey tool. In doing so, researchers can be more confident that the survey tool is collecting the correct data for interpreting the perception of occupational therapy among Early Intervention personnel. Another recommendation for future research is to provide an incentive for participating in the study. An added incentive would likely result in a higher number of respondents. Since having Early Intervention experts as resources in Indiana was beneficial for this study, it is also recommended that future researchers recruit Early Intervention experts in the contiguous states. These experts can act as mentors to the researchers in understanding each state's differences in the referral process, as well as providing the researchers with updated contact information for potential respondents.

The present study only investigated perception of service utilization in early intervention personnel at a regional level. To gain a fuller understanding of this topic it would also be necessary to replicate this study at a national level with a larger sample. Such studies should examine whether outcomes are the same for a child that receives developmental therapy versus occupational therapy, examine the state differences between the definitions of occupational and developmental therapy, and whether access to services influences which profession receives the referral for services.

### Conclusion

Based on the results of this study, the research team came to the conclusion that some determiners of early intervention services perceive an overlap amongst the scope of practice for occupational therapy and developmental therapy in Early Intervention. Moreover, this study also highlighted the confusion concerning occupational therapy's scope of practice

within Early Intervention. In particular, this may be due to the different language used in the definition of occupational therapy's scope of practice for Indiana and the contiguous states. Even more, some early intervention personnel perceive that occupational therapy services are underutilized in the states of Indiana, Ohio, Michigan and Kentucky. In conclusion, development of a universal definition for occupational therapy within Early Intervention will create a better understanding of the profession's scope of practice.

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