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RESEARCH ARTICLE

HIGH PREVELANCE OF TEACHER OBESITY FOUND IN U.S. EARLY CHILDHOOD PRESCHOOL ENVIRONMENTS - PARTICIPANT RESEARCH REVEALS POOR HEALTH HABITS IN TEACHERS BEING SHARED WITH STUDENTS AND NEGATIVELY IMPACTING THEIR EDUCATION

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ABSTRACT

Early Childhood Education (ECE) Occupations are highly demanding, and require solid physical/mental skills to meet demands required to educate young children and succeed professionally; teachers w/hyper-energetic skills are needed for keeping up with learning/growing children and fulfilling their needs. Research reveals this type of active input is lacking from many ECE teachers; studies show it's due to illness including but not limited to obesity, lack-of-mobility, occupational disability, injury and sedentary habits. These impact teacher performance-ability/participation levels which directly impact teaching quality. Meanwhile the U.S. Obesity Epidemic rages on; the already high numbers continue to rise for teachers and students as young as 2. Evidence gathered by undercover "PhD Scientist/Doctor" working as "Teacher" suggest that negative health behaviors are being transferred/shared - and that a teacher's health behaviors - positive or negative are either benefiting or impeding cognitive function and academic success in children. This influence is based on whether teachers share healthy habits or habits of unwellness in the classroom. This triangular link between obesity, a Teacher's sedentary teaching style and degradation of a student's educational experience suggests the Teacher's "Health Status" influences "Performance-Ability."

INTRODUCTION

The focus of this study is to explore the association between obesity prevalence and ECE Teachers and how this prevalence of unwellness directly impacts their teaching quality and indirectly impacts their student's educations. Think for a moment on these words...immobile, obese, sedentary or underactive... These are not words that we want to immediately associate with preschool teachers, but scientific evidence says otherwise. Studies shows that these words share a statistically significant association with ECE teachers, at a higher percentage than the normal control. What are these shocking words doing in Education, and how did they get there? In fact, let's first focus on the real central theme here... obesity! Obesity is significant because it has already been identified as problematic, but of how it serves as a stable platform for multiple illnesses through comorbidity (Heart disease, Diabetes Type II, High Blood Pressure, and functional injuries. Together these illnesses can negatively impact health and behavior, which is at the root of what impacts these teacher's work quality. Obesity is also directly linked to other types of mechanical health issues like loss of mobility, and obesity induced osteo-mechanic failures like slipped disks, lower-back pain bad knee joints(osteoarthritis) and repeated ankle sprains - all leading to loss of mobility, agility and limit range of motion.

This can all combine to impede energetic output from teachers, leading to their main skills being impeded. When teachers need to but can't active teach or engage a 2-5-year old their job quality suffers and this is worse if they suffer from morbid obesity, evidence shows this will intensify their limitations. Sedentary behavior is also usual for someone unwell this way. Sedentary behavior is a feeling of slow moving heaviness and being less interested in movement; it is also socially contagious but avoiding it is important for occupational efficiency so a "Come sit with me attitude" should not dominate a work-zone, especially in a school where children's needs should be prioritized, but what about teachers that feel unwell day after day? This study look to see if evidence can show a statistically significant connection in the teacher's weight and state-of-health may contribute to or impede the overall educational experience a child has in an ECE setting to see if it is directly proportional to the teacher's health...

Teacher's health = What type of experience a child might receive in the classroom

METHODS AND MATERIALS

"The goal of any science is not willful harm to subjects, but the advancement of knowledge and explanation. Any method that moves

us toward that goal is justifiable" (Denzin 1968). To gather this data, a participatory covert observational study was conducted; collection methods were physical observational methods (done by a professional doctor/scientist who went directly into ECE classrooms in USA and worked undercover as a teacher or aide (working legitimately, with required qualifications, credentials, going through the entire hiring process etc.). From 13 locations, a total of 445 (n=445 observations) were conducted on Preschools professionals - observed during a 1-year + 7 day period (11/28/2021-12/7/2022) The duration of observation was for a minimum of 2 hours up to a maximum of daily for 2 months, and their data was collected (as they were observed functioning in their ECE environments) utilizing a structured checklist. This research was conducted covertly to observe real teachers working organically in "Real-Time" as opposed to getting the "Hawthorne Effect."

The Checklist's observational goal was to primarily witness a teacher's health, how teacher's moved around and how functional they were in their educational setting (in both a physical/energetic and mental sense). Everything was recorded; what the teachers did, how they taught, how they talked to the children, how they moved, what they were eating, their relationship with the food, how active they were when working, how they used their phone, and what their general energy/mood habits were overall. While this style of analysis did prevent gathering certain personal statistics, it did allow for organic observation of behaviors and expression from teachers that would have otherwise been shrouded in an overt/open study. What was observed and noted was categorized into 5 categories as the prevalence of obesity, sedentary behavior and a general unwellness amongst teachers: their corresponding behaviors were analyzed to inquire for significant statistical links between unwellness, their teaching quality, and how it impacts the children's educational expedience.

Teachers were rated for 5 specific categories

These were

- Obese, Morbidly Obese or overweight - BMI
- Presence of Visible illness, malady, sickness.
- Presence of injury
- Sedentary or restricted movement (0-5)
- Gender, Age, Economic Demographic,

Impact Level: (Level of attentiveness and engagement with children).(1-5)

Low impact Factor (LMF): Was related to low levels of movement and less intensity in the classroom in the way the ECE Teacher interacted with children = not moving or being less active with less attention for the child, less talking and engaging, and a stronger tendency of being sedentary/not engaging in games/staying seated through the entire day.

Where as

High Impact Factor (HIF) was related to a ECE Teacher being intensely more active and engaged, more energetic with the children, talkative and spontaneous, being agile and mobile in the environment, and being playful and/or fully active. This information was then compiled statistically and analyzed using IBM SPSS Software and using correlation analysis, descriptive analysis and chi-squared factor to gather a value statistics and find statistical significance.

RESULTS

Results showed the following..

Interpretation Of correlation table.

Age * Impact factor P-value (0.002) is less than 0.05. Therefore, correlation between age and impact factor is statistically significant. Age * Agility level P-value (0.001) is less than 0.05. Therefore, correlation between age and agility level is statistically significant. BMI * Agility level P-value (0.003) is less than 0.05. Therefore, correlation between BMI and agility level is statistically significant. Impact factor * Agility Level P-value (0.00) is less than 0.05. Therefore, correlation between impact factor and agility level is statistically significant.

WHAT THE OBSERVATIONS REVEALED

So according to the output results, age and impact factor have a negative correlation. It means that as we age, the impact factor will decrease. When someone reaches an advanced age, their impact factor is likely to be reduced. Age and agility level have a positive correlation. It means that when age increases, agility levels also decreased. When someone is old, there is a high possibility that they will become sedated.

BMI and agility level also have a positive correlation. It means that when BMI increases, agility levels also decrease. When someone is obese, there is a high possibility that they will become sedated.

Impact factor and agility level have a negative correlation. It means when impact factors decrease, agility levels will be reduced. When someone is less active, there is a high possibility of having a poor impact factor.

For categorical data, the chi-square test can be used. According to the Chi-square output results, we can say there is an association between BMI and occupation, between BMI and impact factor, between BMI and agility level, between occupation and economic demographic, and between impact factor and agility level.

DISCUSSION

Discussion is needed to get a deeper understanding of the results and then respond to what is happening to our Teachers, their health and our education system. Our nation needs to contemplate this researched dynamic of teacher obesity impacting our Preschool children's education and future.

DATA SUPPORTS OBSERVATION: The statistical data supports what was observed; so that instead of seeing teachers actively interacting while teaching many teachers did alternative actions like sit, eat, sleep, allow the children to watch online YouTube, personal movies or talk on their phone using headphones; they would zone-out privately or publicly, and either by choice or due to illness... stay tuned-out. It was observed that these distracting activities and "Out-of-Focus" stance lead to an "Out-of-Touch" experience for the children. Instead of teaching, some teachers focused more on having personal conversations/gossiping with other teachers/staff and/or sharing time in social cliques to discuss or distance themselves from the children - this was observed repeatedly during classtime and outdoor/playground time where teachers/staff would be grouped up 2-6 on one far end of the playground away from the children - who should be the focus.

STILL OVERWEIGHT in U.S.A: The U.S. prevalence of childhood obesity is still high, even though national and local campaigns have been instituted to help initiate change [i, ii, iii] Studies show [iv, v, vi] that old interventions to prevent obesity by the government did not work - including the "State Physical Activity and Nutrition program," the "High Obesity Program," and the "Racial and Ethnic Approaches to Community Health Program," so this country needs some new approaches to rectifying obesity. and make a healthy lifestyle affordable and accessible for all. Also, these programs need to have more impact to actually improve situations in high-risk communities that still have to survive on poor-quality nutrition [vii, viii, ix]. Evidence shows that these unhealthy habits are hard to change and that health behavior can and is shared between Teachers and student!

It's not just obesity, but the overall prevalence of unwellness in ECE teachers that needs to be targeted. According to teachers studies [^{ix}], disease clusters are high, with a high percentage of clusters being elevated in Education workers (in weight). According to CDC, nationally the prevalence of severe obesity increased in the past 20 years with an increase from 30.5% to 41.9% in 2017 – March 2020. on average nationally, within the field of ECE education the percentages of obesity are concentrated and rising specifically. [^{xi}] Studies also show [^{xii}] that in addition to Obesity, comorbid related conditions occur in teachers including decreased mobility with weight-related injury and higher incidences of sedentary behavior [^{xiii}, ^{xiv}], heart disease, stroke, chronic illness, Type 2 diabetes [^{xv}]. Even heart health studies in teachers found that [^{xvi}] they themselves reported unwellness, irregularities and weakness physically, while others mentioned stress as a form of mental unwellness that was prevalent [^{xvii}, ^{xviii}, ^{xix}, ^{xx}, ^{xxi}] too, and not just in USA.

In comparison to world statistics, the U.S. population still has a growing tendency towards being obese and unhealthy with its Standard American Diet (SAD Diet) but with national initiatives and dietary menu overhauls in public school systems why is obesity still on the rise?

WHAT ELSE ARE THEY TEACHING

Additional information revealed that ECE Teachers/Educators can teach/share poor lifestyle choices, unhealthy diet, obesity, through “Modeling” and even negative or imbalanced moods. Teaching from an unhealthy mental space shares examples with their students. Evidence shows that these are all things that can be observed but that we change and prevent. Research suggests that teachers can change for the better which can sharply impact how they impact children in a healthier way.

OCCUPATIONAL STATS REVEAL PHYSICAL LIMITATIONS: Occupational statistics for ECE teachers also reveal teachers have a higher incidence of knee and back injuries, foot pain, ankle strains, lower back pain chronic pain and arthritis. [^{xxii}, ^{xxiii}] All of these are intensified by weight, leading to a larger amount of physically limited teachers with sedentary behavior showing up with a higher occurrence when analyzed in comparison to a healthy control.

DIFFICULTY MOVING: Research showed that overweight teachers had a harder time moving around; they were less active because of physical limitations in movement due to pain, injury or illness and therefore had less participation in classroom activities. Although they were observed in all locations, there was a tendency for these teachers to remain seated on the floor for the majority of their time when inside their location to the point where movement from the spot would become difficult; having to get up from the floor or sit down on the hard floor or tiny tot chairs was harder due to obesity limitations [^{xxiv}, ^{xxv}, ^{xxvi}, ^{xxvii}] and extreme size. [^{xxviii}]. This study observed that movement matters, and that children can be motivated to move more if and when they see others moving and they need this. to be motivated by a teacher to enhance the engagement levels in activities..

A SPECIAL PERMIT?: In relation to this and other educational research on the development of teachers, if ECE classrooms are locations where care duties do require special *physical* abilities then a Teacher's “Physical Teaching Permit” may need to be instilled into the licensing process, to get a more specific type of applicant that can be credentialed/certified for both educational agility and physical skills and ability. Instituting new requirements in the future could mean that some teachers now working may have difficulty getting re-licensed if they can't meet new “healthier” requirements! A “Staff Health & Wellness Bonus” could also be used to motivate and reward wellness in teachers/Staff instead!

HOW IS THIS IMPACTING OUR CHILDREN?: Evidence shows that being in the continual presence of unwellness impacts a

child's educational environment, cognitive development and lifestyle habits. Exposing that these dynamics are present in the classroom is like unfolding a bomb. [^{xxix}] How these teachers influence U.S. child and their activity choices, food choices, mood choices [^{xxx}, ^{xxxi}] and future [^{xxxii}] could influence these children to replace normal weight goals for obese weight goals, if obesity is mainly what they see 98-99% of the time modeled from adults in their educational environment, but do teachers deserve to have control over this?. Clear self-awareness and more study is needed in the educational sector to gather these details, and critical improvement in our ECE education/care systems is still needed to activate better for our students' educational experience.

WHAT DOES THIS MEAN FOR OUR FUTURE: A future of “Fat-Influenced,” unhealthy children have slim chance of protecting themselves from obesity in the future! Obesity prevalence was already risen to 12.7% among ECE 2 to 5-year-olds, but then it increases again to 20.7% among 6-year old students in Kindergarten (in Elementary School). For a 5 year-old, an 8% increase in weight in just a few months is a lot for the body to take on. These statistics specifically show that this prevalence of obesity has already begun to impact preschool children in their earliest developmental stages. They are already following an “Obesity supporting Lifestyle” and at 2 years old can find information on how to be obese in how they are treated and what they have learned in their ECE schools and preschool environments modeled there. If their own parents are not obese or unwell, then the time spent in ECE is their major source of this influence.

Summary

Observations revealed scientific statistically significant information on correlations between teachers obesity, their sedentary behaviors, their energetic output and the actual quality of their work. This data supports what was observed.

CONCLUSION

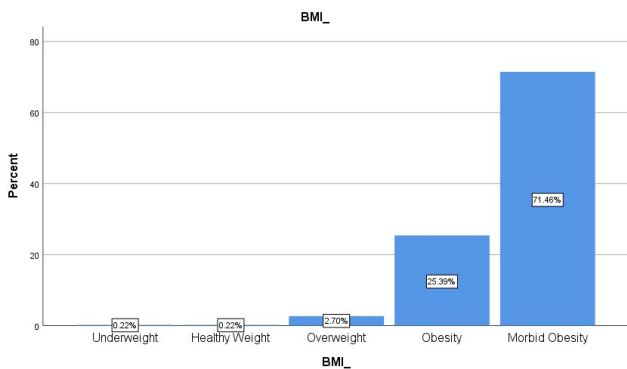
In conclusion, it's clear that obesity, occupational disability are unwellness are on the rise in USA, and this research shows that it is in the classrooms impacting our preschool children and their education both directly and indirectly through their teachers. This study produced evidence that revealed a statistically significant correlation between ECE teacher's health/unwellness, their teaching abilities and the quality and how well they taught and interacted with the children.. Observations found that many teachers were sedentary, (sit down and zone-out use electronic devices), or due to illness stay stationed or sitting in one spot, tuned-out. This type of out-of-focus stance leads to a out-of-touch experience for the children who need educational engagement. Evidence suggests that this lack of movement and participation is non-verbally sharing a message to the young students about unwellness, that obesity is the norm. Young children follow their teacher's eating habits, movement habits and learn a variety of behaviors from these adults who are at a statistically significant occurrence obese and sedentary. Should these individuals be in control of their education? Let's stop this cycle of unwellness and overtly support health in the classroom instead! To get more control over our future outcome. More studies are needed to further assist the health of education professionals in making the decisions needed to truly promote health & wellness in school environments. More obesity treatment and prevention studies in clinical, school and community settings should be considered for assessing ways to boost better health and academic outcomes for ECE students.

APPENDIX

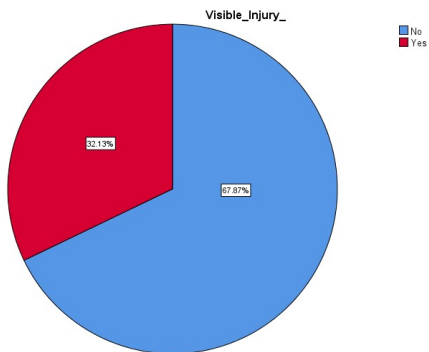
Teacher's Testimonies and segments of statements made under observation: “I would love to be able to move around more with the children but my knees are shot after my last surgery so I can't run with them let alone play.” Angie B 38 Teacher/Morbidly Obese

“I have to have barbaric gastric bypass surgery because the doctor keeps warning me about my weight and my blood sugar. I don’t want to lose my leg or toes like my aunt.” Maria G. 45 Teacher’s Aide/Morbidly Obese/ Limited mobility/Injured/ “I can’t do any heavy lifting over 50 lbs doctor’s orders after my surgery last year...I had to see a therapist and psychologist for a year and a half because of this job.” Ms. Denise Teacher 62/Obese/Injured/Chronic illness/Sedentary “Ohh, I love sweet things...I love these chips(eating them straight from a bag during classtime in the classroom and sharing them with the other teachers)...I love to eat ham for this holiday (interrupting class)... I make the best baked macaroni & cheese... I can eat 3 of those... I like to give these (candy bars) to the kids for a reward...I could eat those every day!” Taylor 29 Teacher’s Aide Morbidly Obese/Chronic Illness/Smart Phone User “I got these from the Bakery... there are croissants in the lounge... did you get that food from the staff party... I bought spaghetti from home... those are fund raisers please buy them...I love sweets...we are foodies here!”

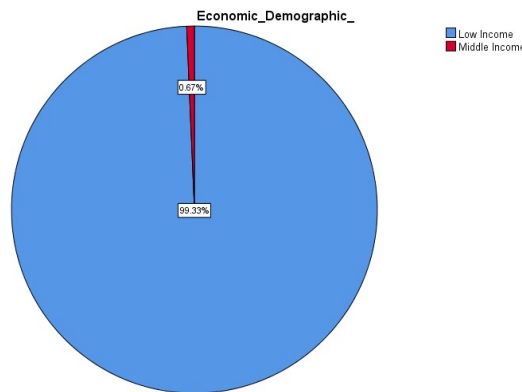
Valid	Underweight	1	.2	.2	.2
	Healthy Weight	1	.2	.2	.4
	Overweight	12	2.7	2.7	3.1
	Obesity	113	25.4	25.4	28.5
	Morbid Obesity	318	71.5	71.5	100.0
	Total	445	100.0	100.0	



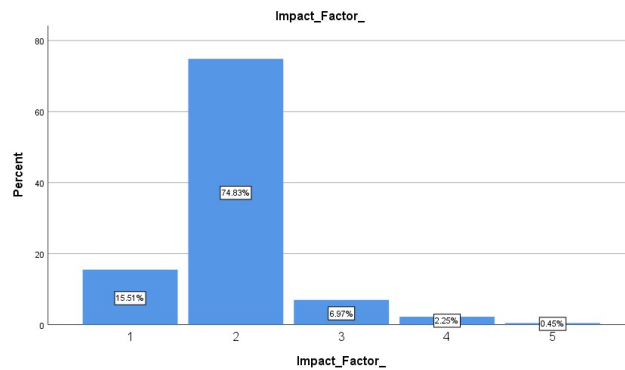
Visible_Injury_		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	302	67.9	67.9	67.9
	Yes	143	32.1	32.1	100.0
	Total	445	100.0	100.0	



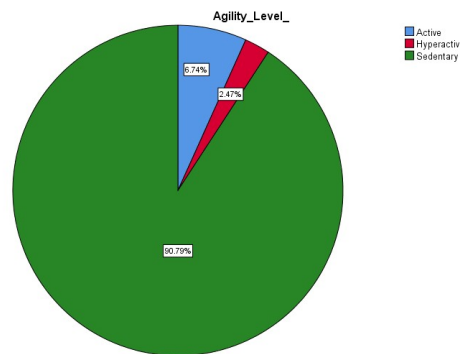
Economic_Demographic_		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Low Income	442	99.3	99.3	99.3
	Middle Income	3	.7	.7	100.0
	Total	445	100.0	100.0	



Impact Factor				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	69	15.5	15.5
	2	333	74.8	90.3
	3	31	7.0	97.3
	4	10	2.2	99.6
	5	2	.4	100.0
	Total	445	100.0	100.0



Agility Level				
	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Active	30	6.7	6.7
	Hyperactive	11	2.5	9.2
	Sedentary	404	90.8	100.0
	Total	445	100.0	100.0



BMI			
	Frequency	Percent	Cumulative Percent

ECE Principal 59, Obese, Chronic Illness, Food Obsession/Limited range of Motion and Mobility According to the above results, p-value is less than 0.05. Therefore, we can reject the null hypothesis. So association between BMI and occupation is statistically significant. According to the above results, p-value is greater than 0.05. Therefore, we can accept the null hypothesis. So, association between BMI and Visible Injury is statistically insignificant. According to the above results, p-value is greater than 0.05. Therefore, we can accept the null hypothesis. So, association between BMI and Economic Demographic is statistically insignificant. According to the above results, p-value is less than 0.05.

Chi – Square Test Results (BMI * Occupation)

			Occupation					Total
			ECE Aide	ECE Office Manager	ECE Teachers	Principal	Special Ed Teachers	
BMI	Underweight	Count	0	0	1	0	0	1
	Healthy Weight	Count	0	0	0	0	1	1
	Overweight	Count	5	0	7	0	0	12
	Obesity	Count	48	0	64	1	0	113
	Morbid Obesity	Count	116	4	192	4	2	318
Total		Count	169	4	264	5	3	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	151.727 ^a	16	.000
N of Valid Cases	445		

H0 (Null) – No association between BMI and Occupation.

H1 (Alternative) – There is an association between BMI and Occupation.

Chi – Square Test Results (BMI * Visible Injury)

			Visible_Injury		Total
			No	Yes	
BMI	Underweight	Count	1	0	1
	Healthy Weight	Count	1	0	1
	Overweight	Count	8	4	12
	Obesity	Count	79	34	113
	Morbid Obesity	Count	213	105	318
Total		Count	302	143	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.286 ^a	4	.864
N of Valid Cases	445		

H0 (Null) – No association between BMI and Visible Injury.

H1 (Alternative) – There is an association between BMI and Visible Injury.

Chi – Square Test Results (BMI * Economic Demographic)

			Economic Demographic		Total
			Low Income	Middle Income	
BMI	Underweight	Count	1	0	1
	Healthy Weight	Count	1	0	1
	Overweight	Count	12	0	12
	Obesity	Count	112	1	113
	Morbid Obesity	Count	316	2	318
Total		Count	442	3	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.180 ^a	4	.996
N of Valid Cases	445		

H0 (Null) – No association between BMI and Economic Demographic.

H1 (Alternative) – There is an association between BMI and Economic Demographic.

Chi – Square Test Results (BMI * Impact Factor)

			Impact Factor					Total
			1	2	3	4	5	
BMI	Underweight	Count	0	0	1	0	0	1
	Healthy Weight	Count	0	0	1	0	0	1
	Overweight	Count	3	8	0	1	0	12
	Obesity	Count	17	81	10	4	1	113
	Morbid Obesity	Count	49	244	19	5	1	318
Total		Count	69	333	31	10	2	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	33.817 ^a	16	.006
N of Valid Cases	445		

Chi – Square Test Results (BMI * Agility Level)

			Agility Level			Total
			Active	Hyperactive	Sedentary	
BMI_	Underweight	Count	1	0	0	1
	Healthy Weight	Count	1	0	0	1
	Overweight	Count	0	1	11	12
	Obesity	Count	10	5	98	113
	Morbid Obesity	Count	18	5	295	318
Total		Count	30	11	404	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	34.568 ^a	8	.000
N of Valid Cases	445		

H0 (Null) – No association between BMI and Agility Level.
 H1 (Alternative) – There is an association between BMI and Agility Level.

Chi – Square Test Results (Occupation * Visible Injury)

			Visible Injury		Total
			No	Yes	
Occupation_	ECE Aide	Count	121	48	169
	ECE Office Manager	Count	2	2	4
	ECE Teachers	Count	172	92	264
	Principal	Count	4	1	5
	Special Ed Teachers	Count	3	0	3
Total		Count	302	143	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.315 ^a	4	.365
N of Valid Cases	445		

H0 (Null) – No association between Occupation and Visible Injury.
 H1 (Alternative) – There is an association between Occupation and Visible Injury.

Chi – Square Test Results (Occupation * Economic Demographic)

			Economic Demographic		Total
			Low Income	Middle Income	
Occupation_	ECE Aide	Count	168	1	169
	ECE Office Manager	Count	4	0	4
	ECE Teachers	Count	263	1	264
	Principal	Count	4	1	5
	Special Ed Teachers	Count	3	0	3
Total		Count	442	3	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	28.297 ^a	4	.000
N of Valid Cases	445		

H0 (Null) – No association between Occupation and Economic Demographic.
 H1 (Alternative) – There is an association between Occupation and Economic Demographic.

Chi – Square Test Results (Occupation * Impact Factor)

			Impact Factor					Total
			1	2	3	4	5	
Occupation_	ECE Aide	Count	23	129	10	7	0	169
	ECE Office Manager	Count	0	4	0	0	0	4
	ECE Teachers	Count	45	195	19	3	2	264
	Principal	Count	1	3	1	0	0	5
	Special Ed Teachers	Count	0	2	1	0	0	3
Total		Count	69	333	31	10	2	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.112 ^a	16	.665
N of Valid Cases	445		

H0 (Null) – No association between Occupation and Impact Factor.
 H1 (Alternative) – There is an association between Occupation and Impact Factor.

Chi – Square Test Results (Occupation * Agility Level)

			Agility Level			Total
			Active	Hyperactive	Sedentary	
Occupation_	ECE Aide	Count	10	6	153	169
	ECE Office Manager	Count	0	0	4	4
	ECE Teachers	Count	18	5	241	264
	Principal	Count	1	0	4	5
	Special Ed Teachers	Count	1	0	2	3
Total		Count	30	11	404	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.643 ^a	8	.576
N of Valid Cases	445		

H0 (Null) – No association between Occupation and Agility Level.

H1 (Alternative) – There is an association between Occupation and Agility Level.

Chi – Square Test Results (Visible Injury * Economic Demographic)

			Economic Demographic		Total
			Low Income	Middle Income	
Visible_Injury_	No	Count	301	1	302
	Yes	Count	141	2	143
Total		Count	442	3	445

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.651 ^a	1	.199
N of Valid Cases	445		

H0 (Null) – No association between Visible Injury and Economic Demographic.

H1 (Alternative) – There is an association between Visible Injury and Economic Demographic.

Chi – Square Test Results (Visible Injury * Impact Factor)

			Impact Factor					Total
			1	2	3	4	5	
Visible_Injury_	No	Count	45	226	24	6	1	302
	Yes	Count	24	107	7	4	1	143
Total		Count	69	333	31	10	2	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.096 ^a	4	.718
N of Valid Cases	445		

H0 (Null) – No association between Visible Injury and Impact Factor.

H1 (Alternative) – There is an association between Visible Injury and Impact Factor.

Chi – Square Test Results (Visible Injury * Agility Level)

			Agility Level			Total
			Active	Hyperactive	Sedentary	
Visible_Injury_	No	Count	24	6	272	302
	Yes	Count	6	5	132	143
Total		Count	30	11	404	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.974 ^a	2	.226
N of Valid Cases	445		

H0 (Null) – No association between Visible Injury and Agility Level.

H1 (Alternative) – There is an association between Visible Injury and Agility Level.

Chi – Square Test Results (Economic Demographic * Impact Factor)

			Impact Factor					Total
			1	2	3	4	5	
Economic_Demographic_	Low Income	Count	68	332	30	10	2	442
	Middle Income	Count	1	1	1	0	0	3
Total		Count	69	333	31	10	2	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.410 ^a	4	.353
N of Valid Cases	445		

H0 (Null) – No association between Economic Demographic and Impact Factor.

H1 (Alternative) – There is an association between Economic Demographic and Impact Factor.

Chi – Square Test Results (Economic Demographic * Agility Level)

			Agility Level			Total
			Active	Hyperactive	Sedentary	
Economic_Demographic_	Low Income	Count	29	11	402	442
	Middle Income	Count	1	0	2	3
Total		Count	30	11	404	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.436 ^a	2	.179
N of Valid Cases	445		

H0 (Null) – No association between Economic Demographic and Agility Level.

H1 (Alternative) – There is an association between Economic Demographic and Agility Level.

Chi – Square Test Results (Impact Factor * Agility Level)

			Agility Level			Total
			Active	Hyperactive	Sedentary	
Impact_Factor_	1	Count	0	0	69	69
	2	Count	0	0	333	333
	3	Count	30	0	1	31
	4	Count	0	9	1	10
	5	Count	0	2	0	2
Total		Count	30	11	404	445

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	837.179 ^a	8	.000
N of Valid Cases	445		

H0 (Null) – No association between Impact Factor and Agility Level.

H1 (Alternative) – There is an association between Impact Factor and Agility Level.

Correlations								
		Age	BMI	Occupation	Visible Injury	Economic Demographic	Impact Factor	Agility Level
Age_	Pearson Correlation	1	.039	-.062	.068	.040	-.143**	.152**
	Sig. (2-tailed)		.411	.193	.151	.399	.002	.001
	N	445	445	445	445	445	445	445
BMI_	Pearson Correlation	.039	1	.008	.037	-.001	-.087	.140**
	Sig. (2-tailed)	.411		.874	.439	.976	.067	.003
	N	445	445	445	445	445	445	445
Occupation_	Pearson Correlation	-.062	.008	1	.045	.034	-.033	-.029
	Sig. (2-tailed)	.193	.874		.346	.480	.481	.537
	N	445	445	445	445	445	445	445
Visible_Injury_	Pearson Correlation	.068	.037	.045	1	.061	-.017	.054
	Sig. (2-tailed)	.151	.439	.346		.200	.715	.256
	N	445	445	445	445	445	445	445
Economic_Demographic_	Pearson Correlation	.040	-.001	.034	.061	1	.004	-.081
	Sig. (2-tailed)	.399	.976	.480	.200		.937	.090
	N	445	445	445	445	445	445	445
Impact_Factor_	Pearson Correlation	-.143**	-.087	-.033	-.017	.004	1	-.625**
	Sig. (2-tailed)	.002	.067	.481	.715	.937		.000
	N	445	445	445	445	445	445	445
Agility_Level_	Pearson Correlation	.152**	.140**	-.029	.054	-.081	-.625**	1
	Sig. (2-tailed)	.001	.003	.537	.256	.090	.000	
	N	445	445	445	445	445	445	445

Therefore, we can reject the null hypothesis. So, association between BMI and Impact Factor is statistically significant. According to the above results, p-value is less than 0.05. Therefore, we can reject the null hypothesis. So, association between BMI and Agility Level is statistically significant. According to the above results, p-value is Greater than 0.05. Therefore, we can accept the null hypothesis. So, association between Occupation and Visible Injury is statistically insignificant. According to the above results, p-value is less than 0.05. Therefore, we can reject the null hypothesis. So, association between Occupation and Economic Demographic is statistically insignificant. According to the above results, p-value is greater than 0.05. Therefore, we can accept the null hypothesis. So, association between Occupation and Economic Demographic is statistically insignificant. According to the above results, p-value is greater than 0.05. Therefore, we can accept the null hypothesis. So, association between Occupation and Agility Level is statistically insignificant.

According to the above results, p-value is greater than 0.05. Therefore, we can accept the null hypothesis. So, association between Visible Injury and Economic Demographic is statistically insignificant. According to the above results, p-value is greater than 0.05. Therefore, we can accept the null hypothesis. So, association between Visible Injury and Impact Factor is statistically insignificant. According to the above results, p-value is greater than 0.05. Therefore, we can accept the null hypothesis. So, association between Visible Injury and Agility Level is statistically insignificant. According to the above results, p-value is greater than 0.05. Therefore, we can accept the null hypothesis. So, association between Economic Demographic and Impact Factor is statistically insignificant. According to the above results, p-value is greater than 0.05. Therefore, we can accept the null hypothesis. So, association between Economic Demographic and Agility Level is statistically insignificant. According to the above results, p-value is less than 0.05.

Therefore, we can accept the null hypothesis. So, association between Impact Factor and Agility Level is statistically significant.

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