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## Improving the Physical Activity and Outdoor Play Environment of Family Child Care Homes in Nebraska Through Go Nutrition and Physical Activity Self-Assessment for Child Care

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**Abstract**

44 **Background:** The purpose of this study was to determine if the Go Nutrition and Physical Activity Self-  
45 Assessment in Child Care (Go NAP SACC) intervention was effective in improving best practices in the  
46 areas of infant and child physical activity and outdoor play and learning in family child care homes  
47 (FCCH) in Nebraska.

48 **Methods:** FCCHs (n =201) participated in a pre-post evaluation using the Infant and Child Physical  
49 Activity and Outdoor Play and Learning assessments from the Go NAP SACC validated measure to assess  
50 compliance with best practices.

51 **Results:** At post, FCCHs demonstrated significant differences in 85% of the Infant and Child Physical  
52 Activity items (17 out of 20), and 80% of the Outdoor Play and Learning items (12 out of 15). Significant  
53 differences in best practices between urban and rural FCCH providers were also found.

54 **Conclusion:** Go NAP SACC appears to be an effective intervention in Nebraska as after participation in  
55 the initiative providers were improving child care physical activity best practices. Additional research is  
56 needed to objectively determine if these changes resulted in objective improvements in children's  
57 physical activity levels. Further, efforts are needed to develop and/or identify geographic specific  
58 resources for continued improvement.

59 **Introduction**

60 Early childhood is a critical time period for developing physical activity behaviors.<sup>1</sup> During this  
61 time, approximately 74% of all 3 to 6 year old children in the United States are in some form of non-parental  
62 care and children 3 years old and under spend an average of 29 hours per week in child care with a  
63 nonrelative.<sup>2</sup> Thus, child care is one environment contributing to children's development of habits and  
64 attitudes toward physical activity, a behavior contributing to the prevention of obesity.<sup>3-5</sup> Childhood  
65 overweight and obesity are associated with the development of chronic disease in adults.<sup>6,7</sup> Improving the  
66 child care environment is a promising venue to increase physical activity levels and potentially prevent  
67 chronic diseases.<sup>8</sup>

68  
69 The Go Nutrition and Physical Activity Self-Assessment for Child Care (Go NAP SACC) is one  
70 existing evidence-based program for improving health outcomes through physical activity and nutrition  
71 policies and practices in child care centers and homes using a 5 step approach.<sup>4,9,10</sup> Go NAP SACC offers  
72 training and resources to early care and education providers to achieve best practices in five core areas:  
73 (1)child nutrition, (2)breastfeeding & infant feeding, (3)infant & child physical activity, (4)outdoor play &  
74 learning, and (5)screen time, with an optional oral health focus.<sup>10</sup> Go NAP SACC has been effective at  
75 improving nutrition and physical activity in the child care setting; however a majority of these studies  
76 were conducted in child care centers.<sup>11-13</sup> Specifically, increases seen in individual child care centers have  
77 led to broader local and state efforts towards improving nutrition and physical activity in children such  
78 as the development of Quality Improvement Systems (QRIS) and updates to state licensing for child  
79 care.<sup>12,13</sup>

80 Few studies have reported on the effectiveness of Go NAP SACC in Family Child Care Homes  
81 (FCCH) explicitly. FCCHs are defined as child care provided in a professional caregivers' home.<sup>14</sup> Currently  
82 in Nebraska, there are almost 3 times as many FCCHs (n=2151) compared to child care centers (n=719)  
83 caring for children between 3 months to 5 years of age.<sup>15</sup> FCCHs differ slightly from child care centers as

84 they typically have fewer staff and financial resources. Previous NAP SACC research in FCCHs found  
85 significant improvements in physical activity policies and practices using self-assessments.<sup>13</sup> Delaney and  
86 colleagues (2014) suggested that additional provider characteristics such as urban or rural location is  
87 needed to determine appropriate recommendations for policy and practice in order to provide  
88 important contextual information for providers.<sup>16</sup> Further, in Nebraska, a majority of FCCHs are in rural  
89 areas. This is concerning as rural populations often encounter greater health disparities compared to  
90 their urban counterparts.<sup>17</sup> Therefore, the purpose of this study was to determine if Go NAP SACC was  
91 effective in improving best practices in two physical activity areas: infant and child physical activity and  
92 outdoor play and learning, in FCCHs in Nebraska. A secondary purpose was to determine differences  
93 between best practices in FCCHs located in urban and rural areas in Nebraska.

#### 94 **Methods**

95 This pre-post intervention study examined changes in physical activity best practices in FCCHs (n  
96 =201) who provided care to children up to 5 years of age and completed Nebraska Go NAP SACC  
97 between August 2014 and August 2016. This study was exempt from approval by an institutional review  
98 board.

#### 99 **Nebraska Go NAP SACC**

100 In Nebraska, collaborative efforts to provide Go NAP SACC to child care homes and centers have  
101 been occurring since 2010. Nebraska first brought Go NAP SACC to the state in 2010 when the Nebraska  
102 Department of Health and Human Services (DHHS) received funding from the Centers for Disease  
103 Control and Prevention to improve environments in early child care education facilities. In 2011,  
104 Nebraska Department of Education's Team Nutrition Program received a USDA grant to pilot it in child  
105 care centers. From the success found in those grants, additional partners, such as the Child and Adult  
106 Food Program (CACFP) Sponsor Organizations, Nebraska Extension, local health departments, healthcare

107 systems, and local nonprofit agencies, also came to the table to help expand Go NAP SACC related  
108 efforts across the state. Since the beginning of Go NAP SACC over one thousand providers have received  
109 training. Currently there are almost 30 Nebraska Go NAP SACC trainers statewide.

#### 110 **Sample**

111 FCCH providers in all 93 Nebraska counties (average of 2,275 providers per year) were eligible to  
112 participate in GO NAP SACC. Approximately three months prior to offering a training, providers were  
113 recruited through e-mails and newsletters from regional Education Service Units, trainer organizations  
114 (Child and Adult Care Food Program [CACFP] sponsors, health departments, healthcare organizations,  
115 etc.), the NE Go NAP SACC online training calendar, the Nebraska Department of Education's Early  
116 Childhood Professional Record System, and word of mouth. If an FCCH was interested in participating  
117 they contacted the trainer for the specific training they were registering for which was include on the  
118 advertisement to receive additional information, identify a training, and confirm their interest.

119 Once providers agreed to participate, they completed the online pre self-assessment<sup>18</sup> hosted  
120 through a secure online server at the University of Nebraska-Lincoln (Step 1). Next, providers took part  
121 in a training for themselves and their staff (if applicable; Step 2). The six-hour in-person training which  
122 was developed by Go NAP SACC and modified by partners to make it specific to Nebraska focused on  
123 child and adult obesity; child nutrition, physical activity, personal health and wellness; working with  
124 families; and breastfeeding and infant feeding. Trainings were typically held for a single six-hour time  
125 period on a Saturday. Approximately one and a half hours of each training was spent on physical  
126 activity-related items. The physical activity portion of the training focused on describing the importance  
127 of providing active play opportunities, specific components of the environment that help to encourage  
128 activity (best practices), the role of child care staff in helping to develop active lifestyles, and identifying  
129 actionable items they could implement in their FCCH. Trainings were interactive and included example

130 physical activities along with discussions amongst providers. Step 3 consisted of an individual meeting  
131 with the Nebraska Go NAP SACC trainer to review the pre-assessment, identify areas they would like to  
132 improve and set goals. Over the next three to four months approximately, trainers provided technical  
133 assistance through either phone, e-mail, or in person to the providers to help them achieve their goals  
134 (Step 4). Once the provider had met their goals, their trainer encouraged them to complete the post  
135 self-assessment (Step 5). The entire process took on average four to five months. After completion of  
136 the post-assessment, providers received their training certificate for the approved hours, as well as their  
137 incentives for participating in the program.

138           Participating FCCH providers who completed Nebraska Go NAP SACC trainings received six in-  
139 service hours, which helped them to meet their requirements for Nebraska child care licensing.

140 Participating FCCH providers also received nutrition and physical activity related additional teaching  
141 tools after they completed the program (e.g., physical activity materials such as the animal trackers  
142 curriculum, fitness dice, parachutes, activity mats) based on their needs. Annual in-service/professional  
143 development opportunities were provided for trainers in the summer of 2015 and 2016.

#### 144 **Measures**

145           To address physical activity environments, 2 of the 5 Go NAP SACC sections were assessed: The  
146 Infant and Child Physical Activity section which consists of 20 questions based on five categories (time  
147 provided, indoor play environment, daily practices, educational and professional development, policy)  
148 and the Outdoor Play and Learning section which consists of 15 questions based on four categories  
149 (outdoor playtime, outdoor play environment, educational and professional development, policy). The  
150 Go NAP SACC self-assessment tool has been widely used and previously validated.<sup>12,13,19</sup> Participating  
151 FCCHs' answers were based on a four-point scale. Answers varied based on the question and were  
152 coded as 1 = marginally meeting child care standards, 2 = meeting child care standards, 3 = exceeding



153 child care standards, and 4 = far exceeding child care standards and using best practice based on Go NAP  
154 SACC recommended best practices.<sup>13</sup>

## 155 **Statistical Analysis**

156 Using the results from the Go NAP SACC pre and post self-assessments for the two physical  
157 activity related sections, descriptive statistics were calculated. The data's normality were assessed using  
158 the Kolmogorov–Smirnov test. A Kolmogorov–Smirnov test and a visual inspection of their histograms,  
159 normal Q-Q plots and box plots showed that the scores of Physical Activity and Outdoor Play of FCCHs  
160 were normally distributed ( $P > 0.05$ ); therefore, we could use the parametric statistical methods, the  
161 Paired sample t-test and linear regression analysis. A Paired Sample t-Test was conducted to examine  
162 differences in Go NAP SACC scores from pre-test to post-test. A multivariate analysis of covariance  
163 (MANCOVA) was used to determine where there were any statistically significant differences between  
164 the adjusted means of physical activity best practices at FCCHs in rural communities compared to urban  
165 communities, having controlled for a CACFP participation. For the purpose of this study, counties were  
166 used as a basis for rural-urban designation into one of three-categories of metropolitan, micropolitan,  
167 and rural.<sup>20</sup> Metropolitan status was defined as any area with a population of 50,000 or more residents  
168 ( $n=2$  counties) and additional seven of which were metropolitan “outlying” counties ( $n=7$ ). Micropolitan  
169 status was defined as an area with a population of 10,000 or more residents ( $n=10$ ). Rural status  
170 consisted of any population smaller than micropolitan ( $n=74$ ). For the purpose of the analysis and  
171 consistent with other literature, micropolitan and rural counties were combined to be able to compare  
172 differences across urban (metropolitan) and rural (micropolitan and rural).<sup>21,22</sup> All analyses were  
173 conducted using the statistical software package IBM Statistical Package for Social Sciences (SPSS)  
174 version 21.

## 175 **Results**

176 Basic demographics about participating FCCHs are presented in Table 1. A total of 350 providers  
177 began an assessment in the online database but only 201 completed both pre and post-assessment and  
178 thus were used for analysis. Of those who complete, 2268 children from different age groups received  
179 care from these FCCHs. Overall, 55.7% of child care settings were located in rural areas.  
180 Note: all the school-aged children were excluded from the analysis.

181 <Insert Table 1 approximately here>

182 At baseline, on average FCCHs met the minimum standards for all areas of the assessment. The  
183 questions with the lowest average score were in regards to having a written policy for physical activity  
184 (2.29, SD=.42) or outdoor play (2.14, SD=.43), offering families information on outdoor play and learning  
185 (2.16, SD=.43), and having a garden in the outdoor play area (1.91, SD=.40). At post, FCCHs  
186 demonstrated significant increases in meeting best practices in 85% of the Infant and Child Physical  
187 Activity topics (17 out of 20), and 80% of the Outdoor Play and Learning topics (12 out of 15).

### 188 **Infant and Child Physical Activity**

189 With respect to infant and child physical activity, significant improvements were found in all five  
190 categories: time provided (4 of 5); indoor play environment (3 of 4); daily practices (2 of 4); educational  
191 and professional development (6 of 6); and policy (1 of 1) (Table 2). It is important to note that the 3  
192 questions in which a significant difference was not found had a reasonably high score at baseline (>3).  
193 The largest improvements were found in the frequency of offering families information on children's  
194 physical activity from an average less than 1 time per year (2.3, SD=.44) to 1 time per year (3.04, SD=.52)  
195 and that this information was more likely to cover 2-3 physical activity-related topics (i.e.,  
196 recommended amounts, motor skill development) in comparison to just 1 topic.

197 <Insert Table 2 approximately here>

198 Ten areas were still below a 3.5 indicating they were not exceeding child care standards and  
199 meeting best practice. The lowest of these areas included offering tummy time to non-crawling infants;  
200 the amount of adult-led physical activity; the amount of time outside of naps and meals that infants  
201 spent in seats, swings, or excersaucers; the programs collection of posters, books, and other learning  
202 materials that promote physical activity include a large variety; use of physical activity during daily  
203 routines, transition, and planned activities; informally talking to children about the benefits of physical  
204 activity; completing professional development on physical activity; offering families information on a  
205 variety of physical activity topics; and their program’s policy on physical activity included more than six  
206 of the best practice topics (i.e., amount of time provided, limiting long periods of seated time).

### 207 **Outdoor Play and Learning**

208 With respect to outdoor play and learning, significant improvements were found in all four  
209 categories: outdoor playtime (3 of 3); outdoor play environment (2 of 7); education and professional  
210 development (4 of 4); and policy (1 of 1) (Table 3). Similar to the previous findings, those questions that  
211 did not have significant improvements had reasonably high baseline scores. The largest improvements  
212 were again found in offering families information on outdoor play and learning topics moving from an  
213 average of less than 1 time per year (2.16, SD=.43) to 1 time per year (2.93, SD=.47) and providing a  
214 written policy including 3-5 topics (2.88, SD=.49) compared to 1-2 topics (2.14, SD=.49). There were six  
215 areas that still had the greatest room for improvement, the lowest of which included amount of outdoor  
216 space that is shaded; offering a variety of play areas; providing and growing food within a garden;  
217 completing professional development on outdoor play and learning; offering families information on  
218 outdoor play more frequently; and including more topics within their written outdoor play and learning  
219 policy.

220 <Insert Table 3 approximately here>

**221 Urban and Rural Variation**

222 When examining differences between urban and rural providers significant differences were  
223 found in 20% of the Infant and Child Physical Activity items (4 out of 20), and ~13% of the Outdoor Play  
224 and Learning items (2 out of 15) (Table 4). In regards to the Infant and Child Physical Activity items,  
225 urban FCCH providers in comparison to rural providers reported significantly higher practices regarding  
226 availability of indoor portable play equipment in good condition for indoor use; supervising, verbally  
227 encouraging, and joining in children’s physical activity; using physical activity during daily routines,  
228 transitions, and planned activities; and offering families information on children’s physical activity. In  
229 regards to Outdoor Play and Learning urban providers reported significantly higher availability of  
230 portable play equipment available for outdoor use. However, rural providers were significantly more  
231 likely to have garden space that was large enough to grow fruits and or vegetable to provide children  
232 meals or snacks.

233 <Insert Table 4 approximately here>

**234 Discussion**

235 Overall, similar to other Go NAP SACC research FCCHs demonstrated significant improvements  
236 in best practices for offering an environment conducive to physical activity.<sup>13,23,24</sup> Significant differences  
237 between urban and rural FFCH providers were also found.

238 While FFCH providers reported great improvements there were still 16 areas that were not meeting  
239 best practices. One of these areas was in regards to the programs’ collection of posters, books, and  
240 other learning materials that promote physical activity. A majority of the FCCH providers in this study  
241 participated in USDA’s CACFP which provides access to free training and resources (such as books and  
242 posters).<sup>25,26</sup> However, due to the nature of the program a majority of these resources are focused on  
243 nutrition. Future efforts could focus on developing and/or disseminating physical activity resources in

244 collaboration with USDA's CACFP. For example, USDA/CACFP and/or Team Nutrition could be utilized to  
245 distribute existing nutrition resources that have a physical activity component (e.g., curriculum such as  
246 Sesame Street's Healthy Habits Kit<sup>27</sup>) as well as disseminating physical activity online trainings in  
247 partnership with physical activity professionals. Future research studies are needed to examine the  
248 efficacy of developing and delivering statewide physical activity trainings and resources through the  
249 CACFP and/or Team Nutrition channels.

250 Another area in need of greater improvements within both the physical activity and outdoor play  
251 assessments centered around having a policy and the number of items included within this policy. There  
252 have been significant public health efforts recently to encourage the implementation of written policies  
253 in child care programs. While establishing a written policy does showcase the child care organization's  
254 commitment to a particular health practice, a recent study found within child cares, having a policy  
255 about physical activity was actually associated with less physical activity.<sup>1</sup> Thus, while establishing a  
256 written policy at the child care-level is important, continued efforts are needed to translate policy into  
257 practice. For example, addressing providers concerns about preferred temperatures for outdoor play,  
258 especially in Nebraska which experiences extreme heat and cold, would be important to ensure the  
259 translation of written child care policies into practice.<sup>1</sup>

260 Related to policy is a need to have consistent professional development around both children's  
261 physical activity and outdoor play and learning. While a significant increase was found in the study in  
262 providers' receiving professional development, this was likely due in large part to the Go NAP SACC  
263 training and this area was still one of the top areas in need of greater improvements. Additional  
264 professional development would allow for further training especially in the areas where FCCHs did not  
265 exceed best practices. For example, the amount of adult-led physical activity did not meet best practice.  
266 Child care providers are key to increasing children's level of physical activity through provision of active  
267 games, positive prompts and modeling.<sup>28,29</sup> Other research suggests that child care providers may feel

268 self-conscious of their bodies, their weight and their physical activity abilities limiting their confidence  
269 and self-efficacy to participate in physical activity with children<sup>30</sup>; however, more research is needed to  
270 determine how these beliefs impact the promotion of physical activity in providers. Regardless,  
271 professional development opportunities should focus not only on providers' skills for implementing  
272 physical activity with children but also their own health and well-being.

273 Of the significant differences found between urban and rural providers, all but one indicated that  
274 urban providers reported significantly higher levels of meeting child care standards. Other research has  
275 found that for rural providers' funding and resources for equipment may be a challenge.<sup>23</sup> Given that  
276 FCCHs represent a majority of child care programs in Nebraska, understanding FCCH providers  
277 underlying attitudes, needs, and challenges can contribute to promoting children's physical activity in  
278 child care. Future efforts are needed to explore and address providers' needs as well as to offer targeted  
279 resources and trainings for providers based on their geographic location.

280 It is important to note that when examining the significant differences, several of the changes may  
281 seem like minor improvements. However, these represent practical significance as they represent the  
282 numerous FCCHs across the state making changes regarding physical activity and outdoor play. For  
283 example, the significant improvement in the amount of time provided for preschool children for indoor  
284 and outdoor activity represents a change from FCCHs moving from an average of 90-119 minutes of  
285 activity to more FCCHs offering 120 minutes or more of physical activity. Additionally, several of the  
286 largest areas of improvement came in the form of offering education to families on children's physical  
287 activity. Thus, increasing the potential for improving physical activity levels within the home as well.

288 There were several limitations to this study. First, there were differences in the trainings offered.  
289 Several different agencies across the state (e.g., CACFP, University of Nebraska Lincoln Extension, health  
290 care entities) provided trainings and there were no set standards that trainers had to meet (e.g.,

291 continuing education, fidelity assessments) including standards for previous physical activity experience  
292 or knowledge. Second, there were slight differences in the incentives FCCHs received based on the  
293 sponsoring agency, which may have contributed to achieving best practices. Third, while providers were  
294 encouraged to follow the Go NAP SACC 5-step process in the suggested order, they may have completed  
295 the steps out of order and/or may not have completed their action plan prior to completing the post-  
296 assessment. Fourth, due to the collaborative efforts needed to sustain the program, multiple  
297 organizations with differing priorities provided trainers and minor changes were made to the training  
298 process which could have influenced the fidelity of the trainings. However, a statewide coordinator  
299 trained a majority of the Go NAP SACC trainers from the summer of 2014 onward in order to help  
300 trainers and organizations provide consistent trainings. Fifth, several items within the assessment may  
301 not be feasible to accomplish while participating in Go NAP SACC (e.g., amount of outdoor space that is  
302 shaded, follow-up assessments to determine if changes are being maintained). Finally, this study was a  
303 pre-post design. Future research should conduct a follow-up assessment to determine if these changes  
304 were maintained. Strengths of this paper include the sample size and that significant results were found  
305 over a two-year period as well as large geographic area indicating the results were not likely due to  
306 natural occurrence. Additionally, this is one of the few studies utilizing the revised Go NAP SACC  
307 program with collaboration from multiple partners across the state in a real world setting of FCCHs.

### 308 **Future Direction**

309 In conclusion, Go NAP SACC may be an effective intervention in Nebraska as providers were  
310 improving child care physical activity best practices. Research is needed to determine if these changes  
311 resulted in objective improvements in children's physical activity levels within the FCCH or within the  
312 child's own home as research has found low levels of moderate-to-vigorous physical activity in FCCHs.<sup>16</sup>  
313 The development and/or dissemination of geographic specific resources (urban, rural) would help to  
314 ensure continued improvement in the FCCH environments in Nebraska. Additionally, since over 40% of

315 providers who started the assessments did not complete it and those who completed the post-  
316 assessment may not have taken part in action planning, efforts should focus on ensuring that all  
317 providers complete the entire Go NAP SACC process. Finally, as current standards for licensure in  
318 Nebraska are minimal in regards to physical activity, the revision of the Department of Health and  
319 Human Services Licensure rules and regulations could greatly contribute to improvements in the  
320 physical activity environments in child care.

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## References

1. Erinosh T, Hales D, Vaughn A, Mazzucca S, Ward DS. Impact of policies on physical activity and screen time practices in 50 child-care centers in North Carolina. *J Phys Act Health*. 2016;13:59-66.
2. Measuring America: A child's day: At a glance. United States Census Bureau website [https://www.census.gov/library/visualizations/2015/comm/childs\\_day\\_2015.html](https://www.census.gov/library/visualizations/2015/comm/childs_day_2015.html). Updated March 17, 2015. Accessed June 4, 2017.
3. Glynn SJ. Fact Sheet: Child Care. Center for American Progress Web site. <https://www.americanprogress.org/issues/economy/news/2012/08/16/11978/fact-sheet-child-care/>. August 16, 2012. Accessed May 13, 2017.
4. Ammerman AS, Ward DS, Benjamin SE, et al. An Intervention to Promote Healthy Weight: Nutrition and Physical Activity Self-Assessment for Child Care (NAP SACC) Theory and Design. *Prev Chron Dis*. 2007;4:A67.
5. Birch LL, Ventura AK. Preventing childhood obesity: what works?. *Int J Obes*. 2009;33:S74-S81.
6. Van Cleave J, Gortmaker SL, Perrin JM. Dynamics of obesity and chronic health conditions among children and youth. *JAMA*. 2010;303:623-630.
7. Dietz WH. Health consequences of obesity in youth: Childhood predictors of adult disease. *Pediatrics*. 1998;101:518-525.
8. American Academy of Pediatrics, American Public Health Association, and National Resource Center for Health and Safety in Child Care and Early Education. 2012. *Preventing Childhood Obesity in Early Care and Education: Selected Standards from Caring for Our Children: National Health and Safety Performance Standards; Guidelines for Early Care and Education Programs*, 3rd Edition.

- 356 9. Barnes M. Solving the Problem of Childhood Obesity within a Generation. White House Task  
357 Force on Childhood Obesity Report to the President. Washington, DC: Executive Office of the  
358 President of the United States; 2010.
- 359 10. The 5 steps of Go NAP SACC. Go NAP SACC website [https://gonapsacc.org/about-nap-sacc/5-](https://gonapsacc.org/about-nap-sacc/5-steps-of-go-nap-sacc)  
360 [steps-of-go-nap-sacc](https://gonapsacc.org/about-nap-sacc/5-steps-of-go-nap-sacc). Updated 2017. Accessed May 15, 2017.
- 361 11. Bonis M, Loftin M, Ward D, Tseng TS, Clesi A, Sothorn M. Improving physical activity in daycare  
362 interventions. *Child Obes.* 2014;10:334-41.
- 363 12. Drummond RL, Staten LK, Sanford MR, et al. Steps to a healthier Arizona. *Health Prom Pract.*  
364 2009;10(S2):S156-S167.
- 365 13. Trost SG, Messner L, Fitzgerald K, Roths B. A nutrition and physical activity intervention for  
366 family child care homes. *Am J Prev Med.* 2011;41:392-398.
- 367 14. About family child care. National Association for Family Child Care website  
368 <https://www.nafcc.org/About-Us>. Updated 2016. Accessed May 17, 2017.
- 369 15. Early childhood totals of type and capacity. Nebraska Department of Health and Human Services  
370 website <http://dhhs.ne.gov/publichealth/Documents/statewidedata.pdf>. Updated July 7, 2017.  
371 Accessed May 14, 2017.
- 372 16. Delaney SL, Monsivais P, Johnson DB. Physical activity levels in family child care homes. *J Phys*  
373 *Act Health.* 2014;11:1362-1366.
- 374 17. Rural health disparities. Rural Health Information Hub website  
375 <https://www.ruralhealthinfo.org/topics/rural-health-disparities>. Updated October 31, 2014.  
376 Accessed June 2, 2017.
- 377 18. Nebraska Nutrition and Physical Activity Self-Assessment. NE Go NAP SACC website  
378 <http://negonapsacc.unl.edu/>. Updated June 2017. Accessed May 10, 2017.

- 379 19. Benjamin, B., Ammerman, A., Sommer, J., Dodds, J., Neelon, B., & Ward, D.S. Nutrition and  
380 physical activity self-assessment for child care (NAP SACC): Results from a pilot intervention. *J*  
381 *Nutr Educ Beh.* 2007;39(3):142-149.
- 382 20. Lin, G., & Qu, M. (2016). *Smart use of State Public Health Data for Health Disparity Assessment.*  
383 CRC Press.
- 384 21. Frampton AM, Sisson SB, Horm D, Campbell JE, Lora K, Ladner JL What's for lunch? An analysis  
385 of lunch menus in 83 urban and rural Oklahoma child-care centers providing all-day care to  
386 preschool children. *J Acad Nutr Diet.* 2013;114(9):1367-1374.
- 387 22. Natale R, Page M, Sanders L. Nutrition and physical activity practices in childcare centers versus  
388 family childcare homes. *Early Child Educ J.* 2013;42:327-334
- 389 23. Battista RA, Oakley H, Weddell MS, Mudd LM, Greene JB, West ST. Improving the physical  
390 activity and nutrition environment through self-assessment (NAP SACC) in rural area child care  
391 centers in North Carolina. *Prev Med.* 2014;67:S10-S16.
- 392 24. Tandon PS, Garrison MM, Christakis DA. Physical activity and beverages in home-and center-  
393 based child care programs. *J Nutr Educ Beh.* 2012;44:355-9.
- 394 25. Child and Adult Care Food Program (CACFP). United States Department of Agriculture Web site.  
395 <https://www.fns.usda.gov/cacfp/family-day-care-homes>. Published September 1, 2015.  
396 Accessed May 25, 2017.
- 397 26. Team Nutrition. United States Department of Agriculture Web site.  
398 <https://www.fns.usda.gov/tn/resource-library>. Published May 11, 2017. Accessed May 24, 2017.
- 399 27. Healthy Habits. Sesame Street website <http://www.sesamestreet.org/toolkits/healthyhabits>.  
400 Updated 2017. Accessed June 9, 2017.
- 401 28. Brown WH, Pfeiffer KA, Mclver KL, Dowda M, Addy CL, Pate RR. Social and environmental factors  
402 associated with preschoolers' nonsedentary physical activity. *Child Dev.* 2009;80:45-58.

- 403 29. Trost SG, Fees B, Dzewaltowski D. Feasibility and efficacy of a “move and learn” physical activity  
404 curriculum in preschool children. *J Phys Act Health*. 2008;5:88-103.
- 405 30. Copeland KA, Kendeigh CA, Saelens BE, Kalkwarf HJ, Sherman SN. Physical activity in child-care  
406 centers: do teachers hold the key to the playground?. *Health Educ Res*. 2012;27:81-100.
- 407

**Table 1.** Characteristics of FCCHs facilities

	n	Total N	(%)
No. of Providers who Completed	201	350	57.40%
Total No. of Children		2068	
0-23 months	483		23.40%
24-35 months	664		32.10%
3-5 years	921		44.50%
No. of children in urban	1051		50.80%
No. of children in rural	1017		49.20%
CACFP Participation	166	201	82.60%
Residence/Location		201	
Urban Classification	89		44.30%
Rural Classification	112		55.70%

**Table 2.** Infant and Child Physical Activity Items (N=201)

	Pre-	Post-	P- Value
<b>Time provided</b>			
Amount of daily time provided for children's indoor and outdoor physical activity	3.19(.23)	3.52(.33)	.03*
Offering tummy time to non-crawling infants	2.94(.51)	3.25(.54)	<.01**
Amount of daily adult-led physical activity provided	2.84(.46)	3.18(.30)	<.01**
Amount of time children are asked to remain seated at any one time	3.50(.32)	3.65(.43)	.26
Amount of time infants spend in seats, swings, or ExerSaucers	2.48(.25)	2.84(.34)	<.01**
<b>Indoor play environment</b>			
Availability of indoor portable play equipment in good condition	3.37(.52)	3.63(.41)	<.01**
Offering portable play equipment to children during indoor free play time	3.27(.31)	3.60(.36)	<.01**
Offering developmentally appropriate portable play equipment to infants	3.68(.67)	3.79(.73)	.67
Availability/Variety of a collection of posters, books, and other learning materials that promote physical activity	2.33(.41)	2.93(.48)	<.01**
<b>Daily practices</b>			
Removal of children from active playtime for longer than 5 minutes †	3.39(.62)	3.55(.67)	.38
Supervising, verbally encouraging and participating in children's physical activity	3.29(.59)	3.55(.64)	.04*
Interacting with infants to help build motor skills	3.43(.68)	3.59(.71)	.07
Using physical activity during daily routines, transitions, and planned activities	3.04(.43)	3.44(.47)	<.01**
<b>Education and professional development</b>			
Leading planned lessons for children focused on building gross motor skills	3.34(.54)	3.62(.56)	<.01**
Talking with children informally about the importance of physical activity	2.95(.48)	3.44(.59)	<.01**
Completing professional development on children's physical activity	2.71(.31)	3.21(.38)	<.01**
Covering a variety of topics as part of this professional development	3.30(.53)	3.70(.64)	<.01**
Offering families information on children's physical activity	2.30(.44)	3.04(.52)	<.01**
Offering families a variety of information on children's physical activity	2.57(.46)	3.35(.63)	<.01**
<b>Policy</b>			
Having a written policy on physical activity including a variety of topics	2.29(.42)	2.97(.49)	<.01**

409 Scores reported on a 4-point Likert scale, with 1 being marginally meeting childcare standards and 4 being far  
 410 exceeding childcare standards and using best practice. The actual answer options differed depending on question.

411 \* indicates  $p < .05$ ; \*\* indicates  $p < .01$

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**Table 3.** Outdoor Play and Learning Items ( $N=201$ )

	Pre-	Post-	<i>p</i> - Value
<b>Outdoor playtime</b>			
Providing outdoor play time	3.12(.41)	3.59(.64)	<.01**
Providing 60 minutes or more outdoor play time	3.33(.52)	3.68(.56)	<.01**
Using the outdoors for a variety of activities (free play, structured learning opportunities, seasonal outdoor activities, walking trip or field trips)	3.41(.67)	3.62(.72)	0.04*
<b>Outdoor play environment</b>			
Providing ample shade in the outdoor play space	3.24(.32)	3.32(.47)	.15
The open area used for outdoor games and group activities is large enough for all children	3.82(.76)	3.88(.79)	.34
Offering a variety of outdoor play spaces	3.05(.39)	3.40(.55)	<.01**
The garden in the outdoor play space grows fruits and/or vegetables for children's meals and snacks	1.91(.40)	2.36(.45)	<.01**
Providing a variety of portable play equipment in good condition	3.51(.61)	3.62(.68)	.12
Offering children portable play equipment during outdoor active playtime	3.58(.65)	3.72(.70)	.21
Offering enough portable play equipment so that it is available for each child	3.70(.69)	3.77(.74)	.39
<b>Education and professional development</b>			
Completing professional development on outdoor play and learning	2.45(.38)	3.14(.44)	<.01**
Covering a variety of topics as part of this professional development	2.95(.53)	3.52(.62)	<.01**
Offering families information on outdoor play and learning	2.16(.43)	2.93(.47)	<.01**
Offering families a variety of information on outdoor play and learning	2.43(.45)	3.25(.54)	<.01**
<b>Policy</b>			
Having a written policy on outdoor play and learning including a variety of topics	2.14(.43)	2.88(.49)	<.01**

415 Scores reported on a 4-point Likert scale, with 1 being marginally meeting childcare standards and 4 being far  
 416 exceeding childcare standards and using best practice. The actual answer options differed depending on question.

417 \* indicates  $p<.05$ ; \*\* indicates  $p<.01$

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**Table 4.** Significant Effects for Physical Activity and Outdoor Play in Rural and Urban Communities. (at  $p < .05$  level)

Dependent Variable	<i>df</i>	<i>df error</i>	<i>F</i>	Location	Means( <i>SD</i> )
<b>Infant and Child Physical Activity</b>					
<b>Indoor play environment</b>					
Availability of indoor portable play equipment in good condition	1	198	7.72	urban	3.54(.58)
				rural	3.18(.46)
<b>Daily practices</b>					
Supervising, verbally encouraging and participating in children's physical activity	1	198	6.18	urban	3.40(.43)
				rural	3.08(.32)
Using physical activity during daily routines, transitions, and planned activities	1	198	4.57	urban	3.28(.47)
				rural	2.85(.40)
<b>Education and professional development</b>					
Offering families information on children's physical activity	1	198	4.04	urban	2.65(.39)
				rural	2.20(.31)
<b>Child Outdoor Play and Learning</b>					
<b>Outdoor play environment</b>					
The garden in the outdoor play space grows fruits and/or vegetables for children's meals and snacks	1	198	3.16	urban	1.93(.25)
				rural	2.33(.34)
Offering enough portable play equipment so that it is available for each child	1	198	10.13	urban	3.73(.66)
				rural	3.29(.53)

Scores reported on a 4-point Likert scale, with 1 being marginally meeting childcare standards and 4 being far exceeding childcare standards and using best practice. The actual answer options differed depending on question.

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