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Professor McGrade

Math 1040

18 April 2013

Term Project: Written Report

Purpose of Study:

This study is to determine if a correlation is present between the number of children an adult woman has and the average amount of sleep she receives per night in hours.

Study Design:

The study is designed to gather a random sample of adult women by surveying every third adult woman encountered at various locations until a predetermined sample size was met. The predetermined sample size per surveyor was a minimum of fifty, providing a minimum sample size of 350 if all potential surveyors completed the minimum requirements. All surveyed subjects will be asked two questions to determine the number of children they have and the amount of sleep the subject receives in an average night.

Data:

Record #	# of Children	Average Hours of Sleep Each Night
1	5	7
2	0	7
3	0	6
4	1	6

Record #	# of Children	Average Hours of Sleep Each Night
5	4	6
6	0	6
7	0	7
8	0	8
9	0	6
10	2	7
11	5	6
12	0	6
13	0	6
14	0	6
15	3	5
16	5	7
17	4	6.5
18	2	7
19	2	7
20	3	7.5
21	1	6
22	4	7
23	2	7
24	6	8
25	0	7
26	1	7
27	3	7
28	2	5
29	4	8
30	1	7
31	2	9
32	3	7
33	1	6
34	4	8
35	2	6
36	2	7
37	2	5
38	1	6
39	3	6
40	3	7
41	4	7
42	1	7
43	5	8

Record #	# of Children	Average Hours of Sleep Each Night
44	4	8
45	2	5
46	5	8
47	6	7.5
48	6	6
49	1	5
50	2	8
51	2	7
52	3	6
53	4	7
54	0	5
55	0	6
56	0	6
57	0	6
58	0	6
59	0	6
60	0	6
61	0	7
62	0	7
63	0	7
64	0	7
65	0	7
66	0	7
67	0	7
68	0	7.5
69	0	7.5
70	0	8
71	0	8
72	0	9
73	1	6
74	1	7
75	1	7
76	1	7
77	1	7
78	1	9
79	2	5
80	2	5
81	2	6
82	2	6

Record #	# of Children	Average Hours of Sleep Each Night
83	2	6.5
84	2	7
85	2	8
86	2	8
87	2	9
88	3	4.5
89	3	6
90	3	6
91	3	7
92	3	7
93	3	7.5
94	3	8
95	4	5
96	4	7
97	4	7
98	4	8
99	5	6
100	6	5
101	6	7
102	6	7
103	0	5
104	0	5
105	0	5
106	0	6
107	0	6
108	0	6
109	0	6
110	0	7
111	0	7
112	0	7
113	0	7
114	0	7
115	0	7
116	0	9
117	1	6
118	1	6
119	1	6
120	1	6
121	1	7

Record #	# of Children	Average Hours of Sleep Each Night
122	1	7
123	1	7
124	1	7
125	1	8
126	1	9
127	2	5
128	2	5
129	2	5
130	2	6
131	2	6
132	2	6
133	2	7
134	2	8
135	2	8
136	2	9
137	3	5
138	3	6
139	3	6
140	3	6
141	3	7
142	3	8
143	4	6
144	4	6
145	4	7
146	4	7
147	4	8
148	5	5
149	5	7
150	6	7
151	6	7
152	4	6
153	3	9
154	2	7
155	1	5
156	1	6
157	4	8
158	3	7
159	4	6
160	1	5

Record #	# of Children	Average Hours of Sleep Each Night
161	2	8
162	4	6
163	1	8
164	3	9
165	3	5
166	5	8
167	1	6
168	4	5
169	2	7
170	2	6
171	3	5
172	4	9
173	2	4
174	4	8
175	2	4
176	3	5
177	3	7
178	1	7
179	2	8
180	4	9
181	3	5
182	3	5
183	1	4
184	2	6
185	3	7
186	1	5
187	2	5
188	1	9
189	3	7
190	4	6
191	2	7
192	2	5
193	1	6
194	2	7
195	3	6
196	2	8
197	2	9
198	3	5
199	1	6

Record #	# of Children	Average Hours of Sleep Each Night
200	3	6
201	2	7
202	4	8
203	0	6
204	0	5
205	3	8
206	6	6
207	3	7
208	0	6
209	3	7
210	1	8
211	1	8
212	4	6
213	3	5
214	2	7
215	2	8
216	3	6
217	0	9
218	2	7
219	0	6
220	3	7
221	2	6
222	0	8
223	2	8
224	3	6
225	4	7
226	4	7
227	2	8
228	4	6
229	3	7
230	3	7
231	4	8
232	2	6
233	0	7
234	2	7
235	4	6
236	0	9

Record #	# of Children	Average Hours of Sleep Each Night
237	2	7
238	9	8
239	0	7
240	1	7
241	0	8
242	0	5
243	1	7
244	4	6
245	2	7
246	3	8
247	1	7
248	2	7
249	4	8
250	3	7
251	0	9
252	3	8
253	0	5
254	5	7
255	4	6
256	5	5
257	3	5
258	6	4
259	1	7
260	3	4
261	1	5
262	3	7
263	4	7
264	6	5
265	1	7
266	4	5
267	0	7
268	2	5
269	2	5
270	2	5
271	1	5
272	5	5
273	5	4
274	6	8

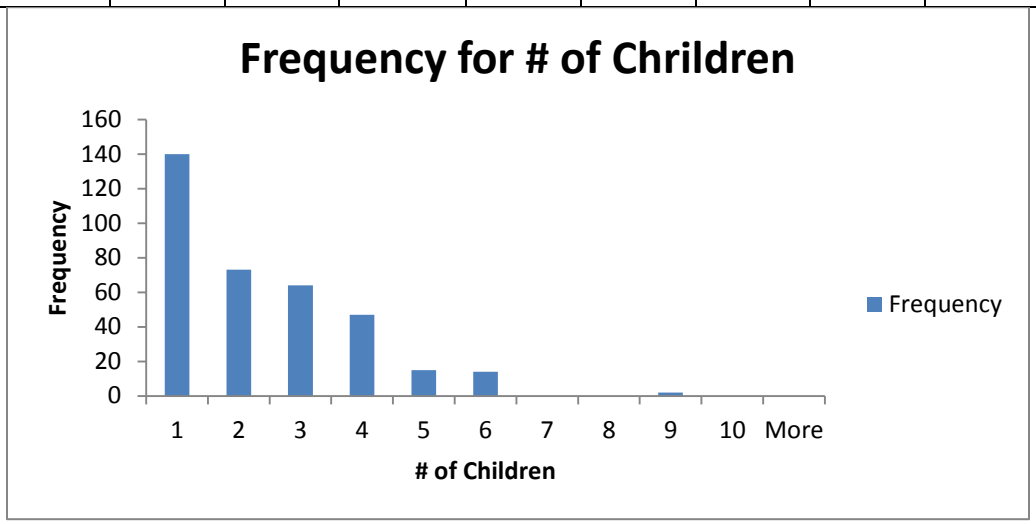
Record #	# of Children	Average Hours of Sleep Each Night
275	1	7
276	5	6
277	0	5
278	0	5
279	4	6
280	0	4
281	3	8
282	3	4
283	0	7
284	4	6
285	3	4
286	0	8
287	3	7
288	4	6
289	1	4
290	1	5
291	3	7
292	1	7
293	3	6
294	0	4
295	4	7
296	1	7
297	3	5
298	0	4
299	1	5
300	1	5
301	1	7
302	1	5
303	1	4
304	0	4
305	6	7
306	3	4
307	0	5.5
308	0	9
309	3	8
310	2	8
311	2	6.5
312	0	7
313	0	6.5

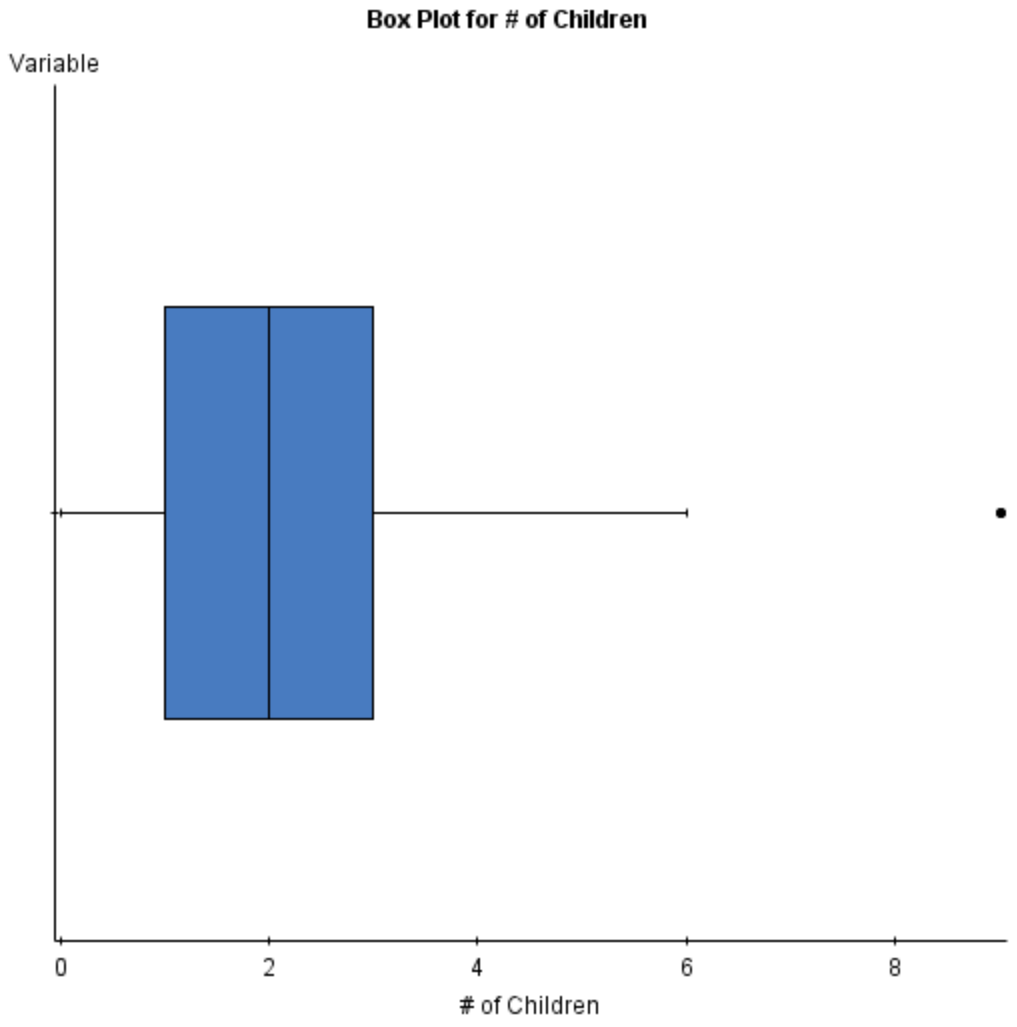
Record #	# of Children	Average Hours of Sleep Each Night
314	2	7
315	3	6.5
316	0	7
317	0	6
318	4	8
319	0	8.5
320	2	8
321	3	8
322	1	4.5
323	0	6.5
324	0	3.5
325	9	6
326	2	5.5
327	4	8
328	1	8
329	4	6
330	1	6
331	1	7
332	5	9
333	3	6
334	4	6
335	2	7
336	1	6.5
337	1	8
338	3	7
339	3	6
340	3	7.5
341	2	6
342	4	5
343	1	6
344	2	6.5
345	1	9
346	2	6
347	0	8
348	2	7
349	1	4
350	6	9
351	0	4.5
352	2	9

Record #	# of Children	Average Hours of Sleep Each Night
353	0	10
354	2	5
355	2	7.5
356	5	6.5

Summary Statistics for # of Children

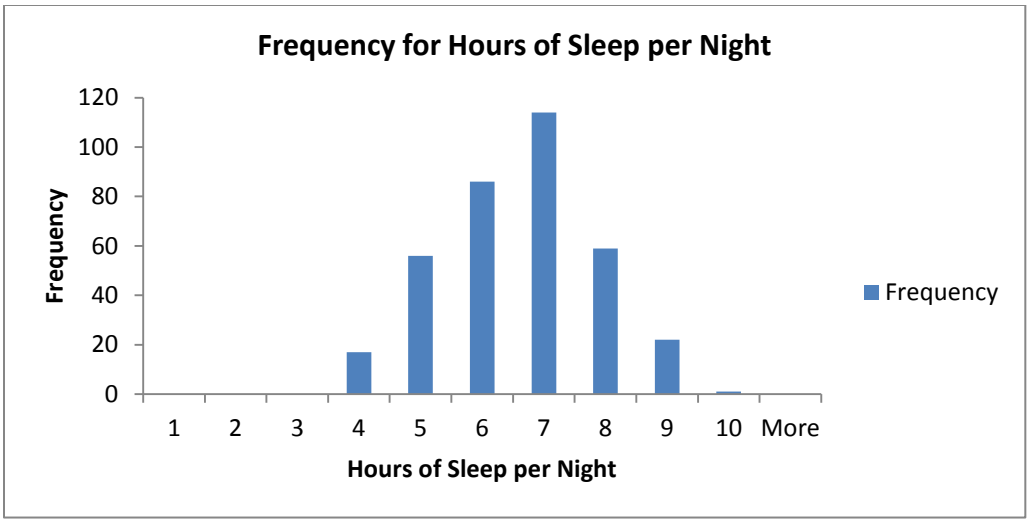
Mean	StDev	Min	Q1	Median	Q2	Max	Range	Mode	Outliers
2.166	1.744	0	1	2	3	9	9	0	9

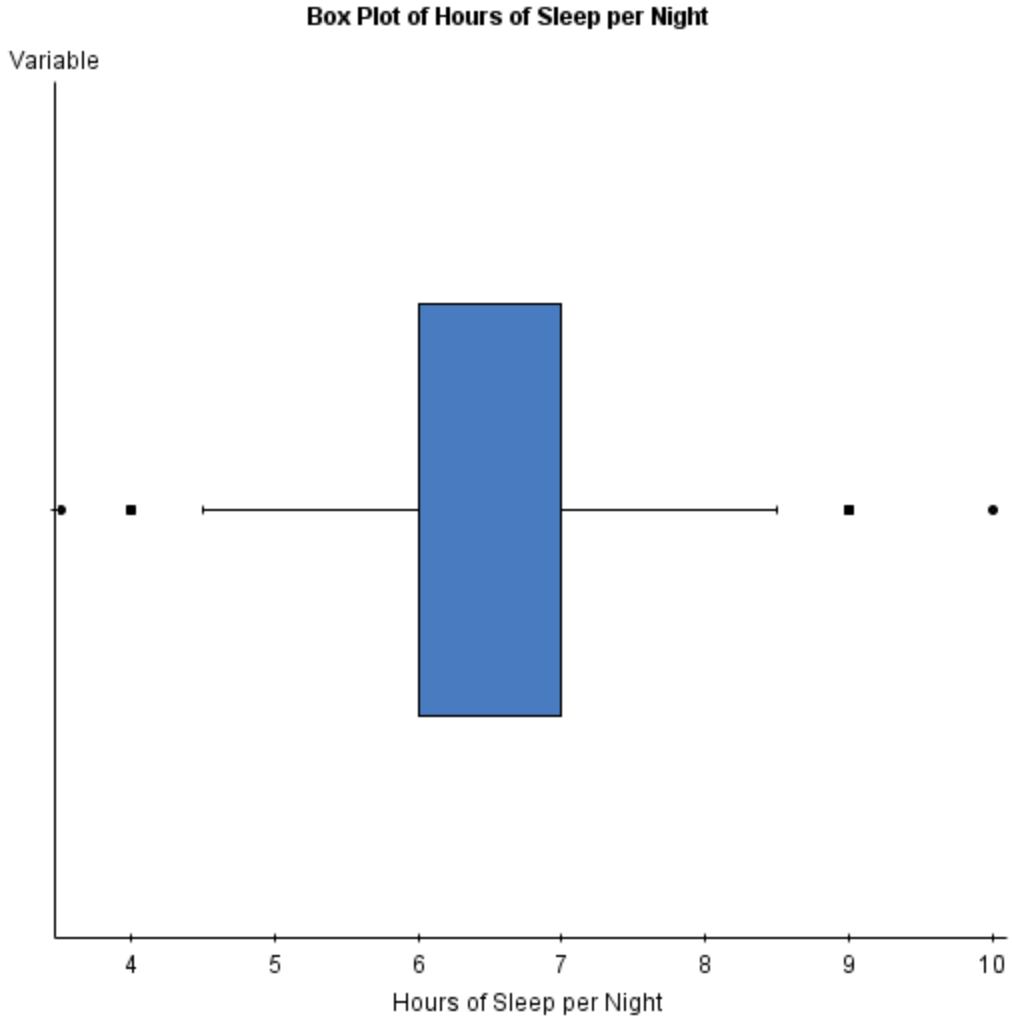




Summary Statistics for Amount of Sleep per Night

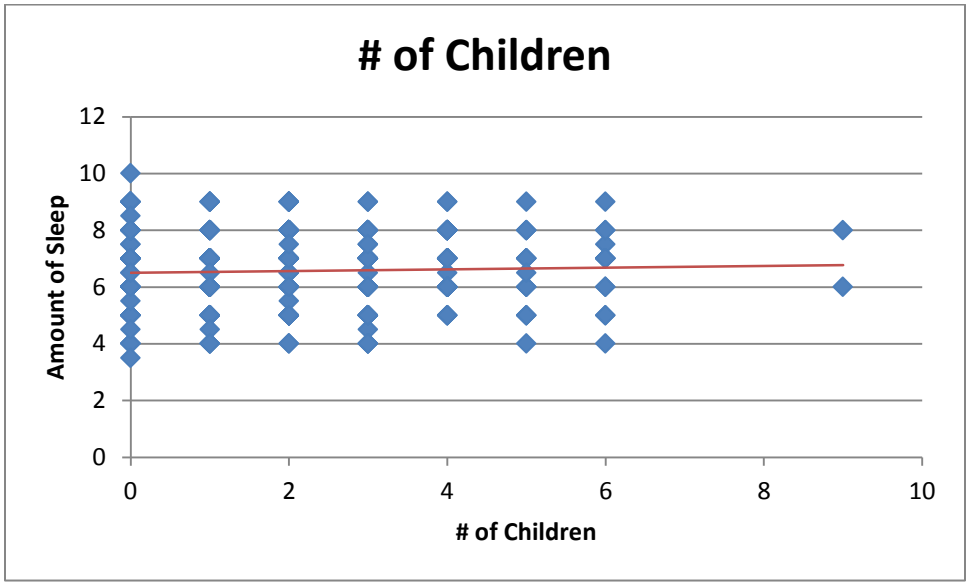
Mean	StDev	Min	Q1	Median	Q2	Max	Range	Mode	Outliers
6.566	1.256	3.5	6	7	7	10	6.5	7	3.5,4,9,10


Frequency for Hours of Sleep per Night
120
100
80
60
40
20
0
Frequency
1
2
3
4
5
6
7
8
9
10
More
Hours of Sleep per Night
Frequency


Box Plot of Hours of Sleep per Night
Variable
4
5
6
7
8
9
10
Hours of Sleep per Night

Linear Correlation Statistics

r= 0.042



Difficulties or Surprises

There were no difficulties or surprises related to the study, either in design or in data collection.

Analysis

The distribution of the explanatory variable, # of children, is skewed right with two occurrences of outliers while the distribution of the response variable, amount of sleep per night, appears to be nearly symmetrical. With the critical value at 0.195 the linear correlation coefficient of 0.042 fails to establish a linear correlation between the number of children an adult woman has and the amount of sleep per night she receives.

Interpretation and Conclusions

As stated above the linear correlation coefficient failed to satisfy the necessary critical value to prove a linear correlation. I do not believe that this study answers the original question due to broad question which translated into a broad population and broad sample. I believe that the question should have been narrowed to a more specific demographic such has adult women with children at home between certain ages. As the question is currently stated the sample and population could include any woman with children regardless of the age or status of the children. From the results it could be inferred that there is no linear relationship between the number of children an adult woman has and the amount of sleep she receives per night. As previously states I believe that this study accurately represents the population based on the original questions but could be altered to be more specific in population and could produce varying results based on those changes.