Childcare and Overweight or Obesity over 10 Years of Follow-Up

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Objective

To investigate the predictive association between preschool childcare arrangements and overweight/obesity in childhood.

Study design

Children were enrolled in a prospective birth cohort in Quebec, Canada (n = 1649). Information about childcare obtained via questionnaires to the mothers at ages 1.5, 2.5, 3.5, and 4 years was used to compute a main childcare arrangement exposure variable (center-based/family-based/care by a relative/nanny). Body mass index was derived from measured weights and heights at ages 4, 6, 7, 8, and 10 years and children were classified as overweight/obese versus normal weight. Generalized estimating equations were used to model the effect of main childcare arrangement (center-based/family-based/relative/nanny) (vs parental care) on overweight/obesity adjusting for several potential confounding factors.

Results

Compared with parental care, children who attended a center-based childcare (OR: 1.65, 95% CI: 1.13-2.41) or were cared for by a relative (OR: 1.50; 95% CI: 0.95-2.38, although with greater

uncertainty) had higher odds of being overweight/obese in childhood (4-10 years). Analyses of number of hours additionally suggested that each increment of 5 hours spent in either center-based or relative childcare increased the odds of overweight/obesity in the first decade of life by 9%. Associations were not explained by a wide range of confounding factors, including socioeconomic position, breastfeeding, maternal employment, and maternal body mass index.

Conclusion
Overweight/obesity was more frequently observed in children who received non-parental care in center-based settings or care by a relative other than the parent. “Obesogeonic” features of these childcare arrangements should be investigated in future studies.

BMI, Body mass index, GEE, Generalized estimating equations, SES, Socioeconomic status

The increase in the prevalence of childhood overweight and obesity in the last few decades is a public health concerns.[1], [2] As the vast majority of preschool-aged children are enrolled in some form of childcare during the day,[3] childcare may have tremendous potential for reducing overweight/obesity through the promotion of healthy diet and physical activity.[4] However, to date, the influence of childcare arrangements on body weight and overweight/obesity is poorly documented, and available studies tend to report adverse effects. We reviewed 9 previous studies on the associations between body mass index (BMI) or overweight/obesity and childcare arrangements.[5], [6], [7], [8], [9], [10], [11], [12], [13] Six were from the US,[7], [8], [9], [10], [11], [12] 2 from Europe,[6], [13] and 1 from China.[5] Seven of these studies reported elevated BMI or increased risk of overweight/obesity in those attending childcare compared with those in parental care,[5], [6], [7], [8], [9], [12], [13] 1 study failed to detect an association,[10] and another study reported reduced risk.[11]

A major limitation of previous research is the short period of follow-up for BMI assessment (ie, 1-3 years),[6], [8], [9], [13] so that the long-term association of childcare with BMI is unknown. Other key shortcomings are the reliance on incomplete history of childcare attendance (eg, information collected retrospectively[5] or covering only 1 year[8]) and reported height and weight.[11] In addition, there has been little research that investigates the association between childcare arrangements and overweight/obesity outside the US. Such studies are needed to clarify whether the negative influence of childcare on overweight/obesity applies in countries with different childcare and prevalence of overweight/obesity. To address these limitations, we aimed to examine the association of type of childcare arrangements from 1.5-4 years on childhood overweight/obesity between 4 and 10 years, within a birth cohort of children from Quebec, Canada.

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Methods
Data for this study were collected for the Quebec Longitudinal Study of Child Development, a prospective birth cohort of singletons born to mothers living in the province of Quebec between October 1997 and July 1998. The target population represents 94.5% of the Quebec population of singleton births, including all ranges of socioeconomic status (SES). Aboriginal people living in Indian reserves (2.1% of all births) were excluded because children from those remote regions were mostly out-of-reach. Children born very prematurely (<24 weeks gestation) were excluded because of high mortality risk; those born >42 weeks gestation were also excluded to avoid delays in selecting the sample. Of 2940 children randomly selected from the Quebec Master Birth Registry of the Ministry of Health and Social Services, 2223 agreed to participate in the study (438 refusals, 186 unreachable, and 93 exclusions due to deaths/physical handicap/twin) and 2120 were retained for the

longitudinal follow-up. Ethics approval from the Institut de la Statistique du Québec's review board and informed parental consent were obtained at each assessment. Children were assessed 5 times over the preschool years (ie, at ages 5 months, 1.5, 2.5, 3.5, and 4 years) and 5 times during the elementary school years (ie, 5, 6, 7, 8, and 10 years).

Mothers were asked about whether the target child was currently attending (and for how many hours per week) any of 7 childcare options: (1) someone else's home, care by non-relative; (2) own home, care by a non-relative; (3) someone else's home, care by a relative; (4) own home, care by a relative other than a sister or brother; (5) own home, care by his/her sister or brother; (6) care in a daycare center; and (7) other. Within each childcare option, <10 hours per week was truncated at 0 hour[8, 14] because infrequent childcare exposure is unlikely to influence BMI. Children were assigned to the type of childcare attended for the most hours (for at least 10 h/wk) at each measurement period (1.5, 2.5, 3.5, 4 years; Table I; available at www.jpeds.com). We labeled option 1 *family-based childcare*, option 2 *nanny/babysitter* childcare, and option 4 *center-based childcare*. Options 3, 4, and 5 were grouped into the *relative care* category, and option 7 (other) was excluded. Center-based childcare is provided to groups of children of similar ages in non-residential arrangements with adult:child varying with age (ie, 1:5 before 1.5 year; 1:8 between 1.5 and 3 years, and 1:10 after 4 years). Family-based care is provided to children of varying ages in a residential arrangements with a 1:6 adult:child.

Most participating families had access to publicly regulated childcare services after age 1 year. The services are largely subsidized by the provincial government either via access to low cost services ($7 per day) or via income tax credits. Regulated services are either provided in centers or in homes (family-based) and must conform to specific child/adult ratios and security norms.

Following our previous work,[15, 16, 17] we created a 5-group variable (center-based/relative/family-based/nanny/parental care) to reflect the main types of childcare arrangements for the cumulative 1.5- to 4-year period. We calculated the total hours spent in each childcare setting (eg, center-based/relative/family-based/nanny) by summing the weekly number of hours from 1.5 to 4 years for all children with at least 3 data points available. Complete information on number of hours was available for 98.3% of the sample. For the remainder of 1.7% of children with missing information at 1 data point, the total number of hours in each childcare setting was calculated from number of hours reported for the 3 other data points. The “main childcare arrangement” reflects the type of childcare attended for the most hours during the whole preschool period. The “parental care” category ie, children who have never been in childcare, was used as the reference category. Children were assigned to the parental care category when their mother did not mention using any form of childcare arrangement across ages. This approach is in line with our previous publications on childcare with this sample[15, 16, 17, 18] and elsewhere.[8, 14]

The proportion of children in a given type of childcare at 1 age that remain in the same type of childcare at the next age (ie, 1.5-2.5; 2.5-3.5; 3.5-4 years) was moderate to high; for center-based: 70.4%-85.9%; for relative care: 39.2%-55.8%; for family-based: 62.5%-71.7%, and for nanny: 40.9%-54.5%. Multiple arrangements were relatively uncommon in this cohort with <5% (range 2.4%-4.3%) of children attending more than 1 childcare setting at each age.

The total weekly number of hours in childcare was computed as the mean of hours across ages in each childcare arrangement (center-based/relative/family-based/nanny). For instance, total hours in center-based childcare were computed by averaging weekly hours in a childcare center at 1.5, 2.5, 3.5, and 4 years. Children who did not experience center-based childcare were coded as 0.

BMIs were obtained by dividing measured weight in kilograms by height squared in meters (kg/m^2) at ages 4, 6, 7, 8, and 10 years. We used the International Obesity Task Force age- and sex-specific cut-points to classify the children as overweight or obese.[19]

Birth weight (low: <2500 g/high: >4000 g vs normal: 2500-4000 g), maternal smoking during pregnancy (no/yes), breastfeeding duration by 1.5 year (range 0-18 months), self-reported maternal BMI recorded when their child was 1.5 year old (range 14.17-47.34 kg/m^2), child's ethnic background (white/other), family SES index (aggregate of annual gross income, parental education level, and occupational prestige based on the scheme of Willms and Shields,[20] range −2.84 to 3.66 z-scores), any maternal employment by age 4 (yes/no), maternal depression symptoms assessed with 13 items from the Center for Epidemiological Study Depression scale (range 0-36),[21] family functioning assessed with a scale containing 12 items measuring communication, problem resolution, and control of disruptive behaviors (range 0-36), and maternal overprotection recorded with 5 items from the Parental Cognitions and Conduct Toward the Infant Scale (range 0-10)[22] were considered as covariates. All variables were assessed from mother's reports when their child was 5 months old (unless specified) except for the child's birth weight, taken from medical report. All questionnaires are available online.[23] Table II presents descriptive statistics for all key variables in the study population.

Table II. Description of the study population*

Categorical variables	Prevalence	
	%	n
Main childcare arrangement (1.5-4 years)†		
Center-based	29.9	583
Relative	11.3	221
Family-based	35.3	688
Nanny	4.3	84
Parental care	19.2	374
Outcomes		
BMI at 4 years		
Normal (or under) weight	87.1	1328
Overweight/obesity	12.9	196
BMI at 6 years		
Normal (or under) weight	86.1	1007
Overweight/obesity	13.9	163
BMI at 7 years		
Normal (or under) weight	84.7	1255
Overweight/obesity	15.3	227
BMI at 8 years		
Normal (or under) weight	80.4	1082
Overweight/obesity	19.6	264
BMI at 10 years		
Normal (or under) weight	73.8	977
Overweight/obesity	26.2	346
Covariates		

Categorical variables	Prevalence	
	%	n
Birth weight		
Normal (2500-4000 g)	85.2	1795
Low (<2500 g)	3.5	73
High (>4000 g)	11.4	240
Maternal smoking during pregnancy		
Nonsmoker	74.7	1577
Smoker	25.3	533
Any maternal employment by age 4 years		
Yes	15.7	310
No	84.3	1666
Child's ethnic background		
White	91.2	1930
Others	8.8	187

Continuous variables	Mean	SD
Breast feeding duration 1.5 year (range 0-18 months)	3.79	4.58
Maternal BMI at 1.5 years (range 14.17 to 47.34)	23.64	4.6
Maternal depression symptoms at 5 months (range 0-36)	5.47	5.23
Family functioning at 5 months (range 0 to 36)	6.15	5.25
Maternal overprotection at 5 months (range 0 to 10)	4.73	2.24
Family SES at 5 months (range −2.84-3.66 z-scores)	−0.01	1.00

Data are courtesy of Institut de la Statistique du Québec.

*n Based on all available data.

†Main childcare arrangement reflected the type of childcare attended for most of the hours between 1.5 and 4 years. To illustrate, for a child who attended center-based care for 40 h/wk, family-based care for 115 h/wk, and relative/nanny care for 0 h/wk, the main arrangement would be "family-based" childcare. A child who attended none of these 4 childcare arrangements would be classified in parental care.

Statistical Analyses

We first described bivariate associations between overweight/obesity at each age (4, 6, 7, 8, and 10 years) and childcare arrangements (center-based/relative/family-based/nanny) measured cross-sectionally (1.5, 2.5, 2.5, and 4 years), and as main arrangement for the 1.5- to 4-year period by cross-tabulations (χ^2 tests). We then investigated the predictive association between cumulative childcare as exposure and overweight/obesity at 4, 6, 7, 8, and 10 years as repeated outcomes by fitting logistic regressions with generalized estimating equations (GEE).[24], [25] We controlled for birth weight, smoking during pregnancy, any breastfeeding duration, maternal BMI, maternal employment, maternal depression symptoms, family functioning, maternal overprotection, child's ethnic background, and SES. We additionally included a continuous variable indicating the child's age for overweight/obesity (eg, 4, 6, 7, 8, 10 years) to account for the rate of change in overweight/obesity over time, and an interaction term with childcare exposure to examine whether rate of BMI change varied between childcare groups. We accounted for within-person correlation across measurement phases by specifying an unstructured correlation matrix. OR and 95% CI were

obtained and Wald χ^2 test was used to establish statistical significance. We also examined whether the number of hours in different childcare arrangements (center-based/relative/family-based/nanny) was associated with overweight/obesity. We therefore ran GEE models while including in the models 4 continuous variables reflecting the total amount of hours spent in center-based, relative, family-based, and nanny childcare.

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Results

Of the 2120 children at the first data collection, 1950 had information on cumulative childcare exposure, of whom 1771 had at least 1 of the 5 BMI measurements (212 had 1, 151 had 2, 200 had 3, 428 had 4, and 780 had 5 BMI measurements). Complete information on covariates was available for 1649 children. A comparison of children included in the analyses (n = 1649) with those excluded (n = 471) because of missing information revealed no significant differences in BMIs. However, excluded children were more likely than those who were included to be from socioeconomically disadvantaged families (mean = −0.24 vs mean = 0.06), boys (56.3% vs 49.9%), in parental care (24.3% vs 18.3%), and non-Caucasian (20.3% vs 5.6%).

The descriptive associations between overweight/obesity at each age and childcare arrangements measured both cross-sectionally and cumulatively are presented in Table III. The results of GEE between overweight/obesity and childcare arrangements adjusted for covariates are shown in Table IV. Compared with parental care, children who attended a center-based childcare had higher odds of being overweight/obese in childhood (4-10 years old). Additionally, children being taken care of by relatives had higher odds of being overweight/obese, although with greater uncertainty (P = .085). There was no association between family-based childcare and nanny/babysitter and children's overweight/obesity over the 6-year period of follow-up. The results for the relationship between overweight/obesity and the number of hours in childcare arrangements are presented in Table IV. Hours in center-based childcare and in relative care were significantly associated with overweight/obesity in childhood. We re-analyzed the data while excluding very pre-term babies (<34 weeks of gestation, n = 6) and pre-term babies (<37 weeks of gestation, n = 99), and the results were unaltered. The rate of overweight/obesity increased significantly with age, ($P \leq .001$), but the child's age by childcare exposure interaction was not significant (P for interaction = .131).

Table III. Cross-tabulations of cross-sectional and main childcare arrangement (from 1.5 to 4 years) and overweight/obesity from 4 to 10 years

	% (n) of Overweight/obesity									
Childcare settings	**4 years**		**6 years**		**7 years**		**8 years**		**10 years**	
	%(n)	***P***	**%(n)**	***P***	**%(n)**	***P***	**%(n)**	***P***	**%(n)**	***P***
At 1.5 year		.075		.002		.374		.846		.271
Center-based	15.2 (22)		20.4 (23)		16.7 (22)		21.5 (28)		23.3 (28)	
Relative	15.4 (31)		21.0 (30)		19.9 (38)		18.1 (30)		30.6 (52)	
Family-based	10.0 (42)		9.6 (33)		13.9 (57)		18.4 (71)		23.3 (93)	
Nanny	6.7 (5)		8.5 (5)		15.6 (12)		22.7 (15)		32.2 (19)	
Parental care	14.2		14.2		14.5		20.0		26.6	

Childcare settings	% (n) of Overweight/obesity									
	4 years		6 years		7 years		8 years		10 years	
	%(n)	*P*	%(n)	*P*	%(n)	*P*	%(n)	*P*	%(n)	*P*
	(96)		(73)		(95)		(118)		(150)	
At 2.5 years		.472		.033		.216		.301		.074
Center-based	14.1 (36)		18.3 (39)		19.0 (47)		24.2 (56)		29.6 (66)	
Relative	14.2 (20)		16.7 (17)		19.3 (26)		18.6 (21)		28.3 (34)	
Family-based	11.5 (48)		10.9 (35)		13.4 (55)		18.0 (68)		20.7 (78)	
Nanny	6.0 (3)		2.7 (1)		13.0 (7)		14.0 (7)		26.5 (13)	
Parental care	13.4 (86)		14.5 (71)		14.6 (91)		19.4 (110)		28.2 (153)	
At 3.5 years		.461		.095		.074		.164		.140
Center-based	12.0 (51)		16.6 (58)		18.2 (76)		23.8 (89)		28.4 (102)	
Relative	16.1 (15)		20.3 (14)		18.7 (17)		19.2 (14)		27.2 (22)	
Family-based	11.4 (52)		10.9 (37)		11.5 (49)		16.7 (66)		21.3 (85)	
Nanny	18.9 (7)		10.3 (3)		17.9 (7)		19.4 (7)		29.7 (11)	
Parental care	13.8 (68)		12.7 (46)		15.2 (72)		18.8 (82)		28.1 (118)	
At 4 years		.757		.008		.016		.333		.132
Center-based	13.7 (69)		17.7 (71)		18.5 (89)		22.4 (97)		27.4 (117)	
Relative	15.5 (13)		21.5 (14)		21.5 (17)		22.1 (15)		26.4 (19)	
Family-based	12.9 (54)		10.1 (31)		11.0 (44)		17.4 (65)		21.1 (78)	
Nanny	11.1 (4)		7.4 (2)		16.7 (6)		23.5 (8)		31.0 (9)	
Parental care	11.3 (54)		12.0 (43)		14.2 (64)		17.9 (73)		28.9 (115)	
Main arrangement (1.5 to 4 years)		.326		.008		.034		.326		.161
Center-based	14.6 (65)		16.9 (61)		18.1 (78)		23.0 (89)		27.1 (103)	
Relative	14.1 (24)		20.6 (26)		20.2 (33)		18.0 (25)		28.1 (41)	
Family-based	12.6 (69)		10.9 (45)		12.3 (65)		18.4 (90)		22.3 (109)	
Nanny	6.9 (4)		7.0 (3)		14.1 (9)		16.7 (10)		26.0 (13)	
Parental care	10.6 (30)		11.2 (24)		13.1 (35)		17.3 (42)		30.6 (70)	

Data are courtesy of Institut de la Statistique du Québec.

P-values obtained from X^2.

n for 4 years (range 1516 at 1.5 year to 1518 at 4 years); n for 6 years (range 1166 at 1.5 year to 1157 at 4 years); n for 7 years (range 1471 at 1.5 year to 1446 at 4 years); n for 8 years (range 1337 at 1.5 year to 1315 at 4 years); n for 10 years (range 1312 at 1.5 year to 1295 at 4 years).

Table IV. OR (95% CI) for overweight/obesity in childhood (4-10 years) for main childcare arrangement and hours in childcare (1.5 to 4 years) using GEE

	Overweight/obesity (n = 1649)			
	OR	**95% CI**		***P***
Main childcare arrangements				
Center-based	1.65	1.13	2.41	.010
Relative	1.50	0.95	2.38	.085
Family-based	1.27	0.85	1.88	.242
Nanny	1.27	0.65	2.47	.483
Parental (reference)	1.00			
Number of hours*, †				
Center-based (range 0-55 hours)	1.09	1.03	1.15	.002
Relative (range 0-46 hours)	1.09	1.01	1.18	.029
Family-based (range 0-55 hours)	0.99	0.94	1.05	.750
Nanny (range 0-48 hours)	1.04	0.90	1.20	.613
Parental (reference)	1.00			

Data are courtesy of Institut de la Statistique du Québec.

Covariates included in the models were birth weight (low: <2500 g/high: >4000 g vs normal: 2500-4000 g), smoking during pregnancy (no/yes), breastfeeding duration by 1.5 year, maternal BMI, maternal employment by 4 years (no/yes), maternal depression symptoms, family functioning, overprotection, child's ethnic background (white/others), family SES.

*n Varied slightly when using hours in childcare as predictors: n = 1665. For 16 children, total hours for the 2 most frequently used childcare arrangements were equal; hence a main childcare arrangement could not be assigned (n = 1649 for main childcare arrangement analysis).

†OR and 95% CI are reported per 5 hours of increase in childcare.

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Discussion

The present results are in line with 5 studies from different countries showing associations of unregulated childcare, mostly by relatives, with overweight/obesity. Using a nationally representative sample of 15 691 US kindergartners from the Early Childhood Longitudinal Study-Kindergarten Cohort, Maher et al[8] found that children who were cared for by a relative, friend, or neighbor in the year before kindergarten (ie, 5.5 years old) were 1.3 times more likely to be obese in

kindergarten than children who were cared for by their parents. Based on the Millennium UK cohort (n = 12 354), Pearce et al[6] documented a risk of overweight/obesity at 3 years associated with informal childcare (mostly grandparents) from 9 months to 3 years old, but only among children from advantaged home environments (risk ratio of 1.4 for parents with high education levels). In a birth cohort of children born in 1997 in Hong Kong and follow-up to age 11 years, preschool (5 years old) and current (11 years old) informal childcare (including grandparents, other family members, or domestic helpers) were associated with ~1.2 times the odds of being overweight or obese at 11 years old.[5] These studies suggested that relative-care may have an adverse influence on overweight/obesity, similarly in different countries. It has been hypothesized that relative caregiving, especially by grandparents, involves less physical activity and greater access to palatable food than parental caregiving.[8] Relative-care is not regulated by public authority.

The influence of childcare centers on children's excess weight has been reported elsewhere,[7, 13] although some studies found no association.[6, 8, 9] One recent longitudinal study in The Netherlands found that children attending center-based childcare were at greater risk of obesity at 2 years old than those in parental care.[13] However, using data from the National Institute of Child Health and Human Development, O'Brien et al[10] did not detect an association between the number of years spent in childcare center and weight problem trajectories between 2 and 12 years. Differences in the quality or regulation of childcare centers with respect to nutrition and physical activities might explain such divergent results.

In the present study, as in many US-based studies,[4] investigations were conducted in contexts where there are few nutrition and physical activity guidelines related to overweight/obesity. In Canada, existing guidelines provide broad recommendations (eg, meals and snacks in accordance with the Canadian food and nutrition guidelines, encouraging high energy output activities such as running or jumping)[26] that may be difficult to implement. The present study, along with previous ones[5, 6, 7, 8, 9, 12, 13] point to the need for investigations focusing on the quality of the nutrition and physical activity in childcare environments.

This study has several methodological strengths, including a large sample of children followed over 10 years; repeated objective measures of weights and heights; repeated information on childcare participation; and inclusion of several covariates to reduce confounding influences. However, the results need to be interpreted in light of the study limitations. First, in observational studies of childcare, there is an inherent possibility that the selection of families into childcare arrangements explains part of the differences in rates of overweight/obesity between childcare groups. Family SES, the main social selection factor, is well controlled in this study via the inclusion of family income, parental education, and parental occupational prestige in the models. In addition, we investigated an extensive list of relevant factors as potential confounding factors and adjusted for those associated with childcare exposure or childhood overweight/obesity (eg, birth weight, smoking during pregnancy, any breastfeeding duration, maternal BMI, maternal employment, maternal depression symptoms, family functioning, overprotection, child's ethnic background, SES). Nevertheless, unmeasured confounders may still partly impact the results. Second, caution is required in generalizing the conclusions to other populations (eg, non-Caucasian populations) and to populations where regulations/quality of childcare arrangements differs substantially. Third, it is unlikely that missing data had a significant impact on our conclusions because there were no differences between children who were included in the multivariable model and those who were not because of missing data in BMI outcomes. However, other differences between included and excluded participants (ie, lower proportion of children from low SES families in multivariate model) suggest that some subgroups of the population may be under-represented. Fourth, in this study, we were interested in the potential impact of the main type of childcare arrangements to which children were exposed for significant amounts of time over their development. The measure of

childcare participation over multiple years required summarizing information. In choosing our exposure variable, we had 2 considerations. First, multiple arrangements are relatively uncommon in our sample and children typically attend the same type of setting during the whole preschool years (as suggested by moderate to high correlations between type of arrangements over time). Second, in order to have an impact on weight change, the environmental exposure needs to be relatively stable and frequent. Therefore, we reasoned that temporary childcare arrangements or those with low intensity would not lead to significant weight changes. We nevertheless conducted sensitivity analyses using the number of hours in each childcare setting, and the results were not altered. Additionally, the nanny group included very few children.

Consideration of nutrition and physical activity in childcare arrangements may be worthwhile for developing childcare programs and policies that would be better adapted to children's needs. Future studies are needed to investigate likely explanation for BMI differences in association with childcare, especially nutrition and physical activity, but several other factors may also be involved. Improved understanding of the mechanisms involved is particularly important as the vast majority of children now experience childcare during the preschool years.

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Appendix

Table I. Prevalence (n) and mean number of hours for 7 childcare options from 1.5 to 4 years

Childcare options	Prevalence % (n)*	No. of hours Mean
Childcare at 1.5 year		
(i)Someone else's home, care by non-relative	27.6 (565)	9.20
(ii)Own home, care by a non-relative	5.2 (106)	1.65
(iii)Someone else's home, care by a relative	9.6 (196)	2.96
(iv)Own home, care by a relative other than sister/brother	4.4 (91)	1.30

Childcare options	Prevalence % (n)*	No. of hours Mean
(v)Own home, care by his/her sister/brother	0.2 (4)	0.04
(vi)Care in a daycare center	9.4 (193)	3.29
(vii)Other	0.4 (9)	0.02
Childcare at 2.5 years		
(i)Someone else's home, care by non-relative	26.9 (538)	9.04
(ii)Own home, care by a non-relative	3.7 (74)	1.25
(iii)Someone else's home, care by a relative	7 (140)	2.24
(iv)Own home, care by a relative other than sister/brother	3.5 (69)	0.91
(v)Own home, care by his/her sister/brother	0.3 (5)	0.06
(vi)Care in a daycare center	17.4 (347)	6.26
(vii)Other	0.3 (6)	0.08
Childcare at 3.5 years		
(i)Someone else's home, care by non-relative	29.3 (572)	9.88
(ii)Own home, care by a non-relative	3.2 (62)	0.84
(iii)Someone else's home, care by a relative	4.9 (95)	1.61
(iv)Own home, care by a relative other than sister/brother	2.7 (53)	0.81
	0.1 (2)	0.01

Childcare options	Prevalence % (n)*	No. of hours Mean
(v)Own home, care by his/her sister/brother		
(vi)Care in a daycare center	29.2 (569)	10.24
(vii)Other	0.6 (12)	0.10
Childcare at 4 years		
(i)Someone else's home, care by non-relative	27.4 (532)	9.22
(ii)Own home, care by a non-relative	3.4 (67)	0.91
(iii)Someone else's home, care by a relative	5.3 (103)	1.52
(iv)Own home, care by a relative other than sister/brother	2.6 (51)	0.76
(v)Own home, care by his/her sister/brother	0.1 (1)	0.01
(vi)Care in a daycare center	33.8 (657)	11.97
(vii)Other	0.4 (7)	0.05

Data are courtesy of Institut de la Statistique du Québec.

Options (iii), (iv), and (v) were grouped into relative-care.

Options (ii) and (vii) were excluded.

Option (i) was labeled family-based childcare.

Option (vi) was labeled center-based childcare.

*n Based on all available data.

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