Preliminary Validation of the Work Productivity Activity Impairment (WPAI) in Caregivers of Children Hospitalized for Respiratory Illness (WPAI: CHRI) in Germany and Canada

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OBJECTIVE:

- Parents of hospitalized infants experience emotional stress and may need to take time away from work.[1,2]
- Hospitalizations for severe lower respiratory tract infections (LRTIs) are common among infants, and more common in high risk infants such as those born premature.
- There are no previous assessments of lost work productivity in working parents due to infant hospitalization for severe LRTI.
- The Parent Burden Study is a multinational initiative to determine the humanistic and economic burden on parents with infants hospitalized with an LRTI. Countries participating in this initiative include Canada, Germany, Slovenia, Korea, and Taiwan.
- The objective of this interim analysis from two countries participating in the Parent Burden Study was to evaluate the construct validity of the Work Productivity and Activity Impairment Questionnaire[3] specific to caregivers of children hospitalized with a respiratory illness (WPAI:CHRI).

METHODS:

- Parents of infants (<1 year of age) hospitalized for a diagnosed LRTI infection in Canada and Germany completed a survey at the time their infant was discharged from hospital.
- The relationship of the WPAI:CHRI measures of work absenteeism (hours of work missed), work presenteeism (impairment while working), and overall work productivity loss for the employed parent cohort and daily activity impairment for the whole parent cohort were tested relative to binary categories above and below median values of the:
  - State Trait Anxiety Inventory (STAI): State Anxiety scale, evaluates changes in transitory anxiety; Trait Anxiety scale, evaluates anxiety as a long-standing personality trait.[4]
  - Parental Stressor Scale: Infant Hospitalization (PSS:IH).[5]
  - Length of hospital stay (LOS).
- Two-sided nonparametric Wilcoxon rank tests were applied to determine if the WPAI:CHRI was able to discriminate between the binary categories.

RESULTS:

- 72 parents completed the survey; of these, 27 were currently employed.
- 29 couples completed the survey; of these, 1 couple were both employed and 3 couples were both unemployed.
- STAI, PSS:IH, and WPAI scores are shown in Table 1:
  - The employed parent cohort reported 37.9% work absenteeism, 55.0% presenteeism, and 38.2% overall work productivity.
  - The whole parent cohort reported 82.6% daily activity impairment.

Table 1: STAI, PSS:IH, and WPAI scores for the employed and whole parent cohorts

Instrument	Employed Parent Cohort N = 27			Whole Parent Cohort N = 72		
	N	Mean±SD (range)	Median	N	Mean±SD (range)	Median
STAI*						
State Anxiety	25	46.2 ±10.8 (23–74)	45	66	45.7±9.4 (23–74)	44
Trait Anxiety	25	40.2±9.7 (21–57)	40	66	40.7±8.7 (21–59)	40
PSS:IH**						
Appearance and Behavior	26	4.2±0.9 (1.7–5)	4.5	70	4.2±0.9 (1.5–5)	4.6
Parent Role Alteration	25	3.8 ±0.7 (2.4–4.8)	3.9	65	3.6 ±0.8 (1.1–5)	3.6
Sights and Sounds	24	3±1 (1–4.6)	3	63	3.1±1.1 (1–5)	3.2
Overall PSS	26	3.7±0.7 (2.3–4.6)	3.9	68	3.7±0.8 (1.4–4.8)	3.9
WPAI†						
% Absenteeism	23	37.9±31.2 (0–100)	28.6	N/A	N/A	N/A
% Presenteeism	26	55±37.7 (0–100)	60	N/A	N/A	N/A
% Overall Work Productivity Loss	23	38.2±31.1 (0.2–100)	29.1	N/A	N/A	N/A
% Activity Impairment	25	72.8±19.5 (30–100)	70	66	82.6±18.8 (30–100)	90

*For each STAI sub-scale, higher values on a scale of 20–80 indicate greater stress.
**For each PSS:IH sub-scale, higher values on a scale of 1–5 indicate greater stress.
†For each WPAI sub-scale, higher values on a scale of 0–100% indicate greater impairment.
N/A, not applicable.

- Table 2 shows that in the employed parent cohort:
  - Higher absenteeism (p=0.002) and overall work productivity loss (p=0.002) were associated with higher STAI State Anxiety scores.
  - Higher absenteeism (p=0.02) and overall work productivity loss (p=0.02) were associated with higher PSS:IH scores.
  - There was a trend towards an association between higher presenteeism and higher STAI State and Trait Anxiety and PSS:IH scores.

Table 2: The relationship of WPAI measures to binary categories above and below median values of the STAI and the PSS:IH scores

WPAI	Stress Measures*	Median of stress measure	High stress ≥ median		Low stress <median		Difference, in WPAI, high vs. low stress	p-value†
			N	Mean (SD) of WPAI score	N	Mean (SD) of WPAI score		
Employed Parent Cohort								
% Absenteeism	STAI State	45	10	60.8 (31.8)	11	20.2 (14.5)	40.6	0.002
	STAI Trait	40	11	50.1 (39)	10	28 (15.2)	22.1	0.204
	PSS:IH	3.9	11	55.5 (35.1)	11	23.6 (13.9)	31.9	0.021
% Presenteeism	STAI State	45	12	61.7 (37.6)	12	50 (40)	11.7	0.5
	STAI Trait	40	12	64.2 (39.2)	12	47.5 (37.4)	16.7	0.253
	PSS:IH	3.9	13	60.8 (39.7)	12	51.7 (36.6)	9.1	0.526
% Overall work productivity loss	STAI State	45	10	61.1 (31.6)	11	20.6 (14.7)	40.4	0.002
	STAI Trait	40	11	50.4 (38.9)	10	28.4 (15.1)	22	0.223
	PSS:IH	3.9	11	55.8 (34.8)	11	24 (14.1)	31.9	0.02
Whole Parent Cohort								
% Daily activity impairment	STAI State	44	32	84.7 (19.5)	29	81.1 (18.9)	3.6	0.435
	STAI Trait	40	29	83.4 (17.2)	31	82.6 (21.1)	0.8	0.769
	PSS:IH	3.9	30	83.7 (19.2)	33	82.2 (23.6)	1.5	0.725

†P value based on two-sided nonparametric Wilcoxon rank test.

- Median LOS of hospitalized infants was 4.7 days.
- Table 3 shows that in the employed parent cohort:
  - Higher absenteeism (p=0.04) and overall work productivity loss (p=0.05) were associated with LOS above the median.
  - There was a trend towards an association between higher presenteeism and higher LOS.

Table 3: The relationship of WPAI measures to binary categories above and below median values for infant LOS

WPAI	LOS ≥median		LOS <median		Difference, in WPAI, long vs. short LOS	p-value†
	N	Mean (SD) of WPAI score	N	Mean (SD) of WPAI score		
Employed Parent Cohort						
% Absenteeism	12	48.5 (32.2)	11	26.3 (26.6)	22.2	0.042
% Presenteeism	13	64.6 (32.6)	13	45.4 (41.2)	19.2	0.232
% Overall work productivity loss	12	48.8 (32.1)	11	26.6 (26.6)	22.2	0.045
Whole Parent Cohort						
% Daily activity impairment	34	85.6 (15.2)	32	79.4 (21.7)	6.2	0.444

†P value based on two-sided nonparametric Wilcoxon rank test.

- In the whole parent cohort, daily activity impairment was high (82.6%) compared to other WPAI categories and did not vary by the validation measures. This suggests that most parents put aside the majority of their daily activities to deal with their infant's hospitalization.

CONCLUSIONS

- The WPAI:CHRI is a valid tool for describing the overall work productivity burden of employed parents of infants hospitalized for an LRTI.
- The WPAI:CHRI may contribute to the understanding of the indirect societal costs of pediatric hospitalization for severe respiratory infections.

References

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