

## Outcomes Star™ Psychometric Factsheet: New Mum Star™

*Dr Anna Good, Triangle Consulting*

*September 2023*

### Background

The New Mum Star is the version of the Outcomes Star designed for women who need support as they prepare to become mums and after their baby is born. It is primarily designed for young, first-time mums but can be used more broadly. The New Mum Star was developed by Triangle in collaboration with the Family Nurse Partnership as part of their innovative ADAPT programme.

More information about the New Mum Star can be found on the Triangle website and in the Development Report: <https://www.outcomesstar.org.uk/wp-content/uploads/New-Mum-Star-development-report.pdf>

### Method and analytic strategy

Routinely collected New Mum Star data entered onto the Star Online was analysed by Triangle to confirm the validity of the New Mum Star as an outcomes measurement tool. In total, 557 service users were included, 275 of whom had a review reading.

A full explanation of the analytic strategy is provided in the accompanying document – Outcomes Star Psychometric Factsheets: Overview.

### Results

#### ***Does it make sense for the different outcome areas of the Star to be included in the same tool?***

**Factor Structure:** The Kaiser-Meyer-Olkin value exceeded the recommended minimum value of 0.60 (Kaiser 1970, 1974) and a significant Bartlett's Test of Sphericity (Bartlett, 1954) supported the suitability of the data for factor analysis. This analysis yielded a unidimensional factor structure explaining 59.7% of the real-data variance.

**Internal Consistency:** Internal consistency was good (Cronbach's  $\alpha = .86$ ).

#### ***Is each outcome area measuring a unique aspect of the service user's situation?***

**Item redundancy:** None of the inter-item correlations exceeded the 0.7 threshold, suggesting little redundancy between areas (see Table 1).

### *Does the Star detect change occurring within a service?*

**Responsiveness to change:** Wilcoxon Signed Rank Test comparing first and second Star readings revealed statistically significant change for all outcome areas. After excluding those who could not move forward (who began at 5 on the individual outcome areas), between 56% and 82% of service users progressed in each area and the effect size was large for three areas and medium to large for the remaining six areas ( $p < .001$ , see Table 2). The results when including service users who could not move forward (because they began at 5 on the individual outcome areas) are shown in Table 3.

### Conclusion

The results of these initial analyses are encouraging and suggest that the New Mum Star is a valid outcomes measurement tool, with a single underlying construct and responsiveness to change.

We are keen to examine consistency in understanding of the scales (inter-rater reliability) and the relationship between Star readings and other measures (convergent and predictive validity). Please contact us if you have New Mum Star data and would like to be involved in this research.

### Further research

External research about the Star as an outcomes and keywork measure can be found on our website: <http://www.outcomesstar.org.uk/about-the-star/evidence-and-research/research-library/#all>

**TABLE 1: Polychoric correlation matrix for outcome areas (N = 557)**

|                               | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   |
|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. Life skills                | -   |     |     |     |     |     |     |     |
| 2. Your health and well-being | .54 | -   |     |     |     |     |     |     |
| 3. Looking after your baby    | .57 | .46 | -   |     |     |     |     |     |
| 4. Your baby's development    | .48 | .46 | .68 | -   |     |     |     |     |
| 5. Safety and stability       | .51 | .43 | .52 | .42 | -   |     |     |     |
| 6. Connecting with your baby  | .45 | .55 | .64 | .61 | .35 | -   |     |     |
| 7. Relationship               | .41 | .48 | .42 | .36 | .58 | .38 | -   |     |
| 8. Family and support network | .41 | .54 | .40 | .41 | .48 | .44 | .48 | -   |
| 9. Goals and aspirations      | .56 | .53 | .45 | .45 | .47 | .47 | .42 | .55 |

**TABLE 2: Responsiveness of the New Mum Star (excluding service users starting at 5 who could not move forward)**

| Scale                         | Time 1 | Time 2 | Wilcoxon   | Effect            | %        | N   |
|-------------------------------|--------|--------|------------|-------------------|----------|-----|
|                               | Median | Median | statistic  | size <sup>1</sup> | readings |     |
|                               |        |        | Z          | r                 | improved |     |
| 1. Life skills                | 3.00   | 4.00   | -10.044*** | 0.48              | 67%      | 221 |
| 2. Your health and well-being | 3.00   | 4.00   | -10.179*** | 0.46              | 67%      | 242 |
| 3. Looking after your baby    | 4.00   | 4.00   | -9.801***  | 0.49              | 73%      | 186 |
| 4. Your baby's development    | 3.00   | 4.00   | -10.552*** | 0.53              | 78%      | 201 |
| 5. Safety and stability       | 3.00   | 4.00   | -8.941***  | 0.50              | 73%      | 161 |
| 6. Connecting with your baby  | 3.00   | 5.00   | -10.306*** | 0.53              | 82%      | 187 |
| 7. Relationship               | 3.00   | 4.00   | -7.609***  | 0.42              | 56%      | 166 |
| 8. Family and support network | 3.00   | 4.00   | -8.332***  | 0.44              | 65%      | 182 |
| 9. Goals and aspirations      | 3.00   | 4.00   | -10.024*** | 0.49              | 58%      | 275 |

\*\*\*  $p < .001$

<sup>1</sup> Cohen (1988) provided rules of thumb for interpreting these effect sizes, suggesting that an r of .1 represents a 'small' effect size, .3 represents a 'medium' effect size and .5 represents a 'large' effect size

**TABLE 3: Responsiveness of the New Mum Star (including service users starting at 5 who could not move forward)**

| Scale                         | Time 1 | Time 2 | Wilcoxon       | Effect                 | %                    |
|-------------------------------|--------|--------|----------------|------------------------|----------------------|
|                               | Median | Median | statistic<br>Z | size <sup>1</sup><br>r | readings<br>improved |
| 1. Life skills                | 4.00   | 4.00   | -9.086***      | 0.27                   | 54%                  |
| 2. Your health and well-being | 3.00   | 4.00   | -8.884***      | 0.27                   | 59%                  |
| 3. Looking after your baby    | 4.00   | 5.00   | -9.064***      | 0.27                   | 50%                  |
| 4. Your baby's development    | 4.00   | 5.00   | -9.504***      | 0.28                   | 57%                  |
| 5. Safety and stability       | 4.00   | 5.00   | -8.470***      | 0.25                   | 43%                  |
| 6. Connecting with your baby  | 4.00   | 5.00   | -9.076***      | 0.27                   | 56%                  |
| 7. Relationship               | 4.00   | 4.00   | -5.451***      | 0.16                   | 34%                  |
| 8. Family and support network | 4.00   | 4.00   | -6.696***      | 0.20                   | 43%                  |
| 9. Goals and aspirations      | 3.00   | 4.00   | -9.298***      | 0.28                   | 58%                  |

\*\*\*  $p < .001$

## References

Bartlett, M. S. (1954). A note on the multiplying factors for various  $\chi^2$  approximations. *Journal of the Royal Statistical Society. Series B (Methodological)*, 296-298.

Cohen, J. 1988. *Statistical power analysis for the behavioral sciences*, Hillsdale, NJ: Lawrence Erlbaum.

Kaiser, H. F. (1970). A second generation little jiffy. *Psychometrika*, 35(4), 401-415

Kaiser, H. F., & Rice, J. (1974). Little jiffy, mark IV. *Educational and psychological measurement*, 34(1), 111-117.