Current Best Evidence: Translating Best Evidence Into Best Care

EDITOR'S NOTE: Studies for this column are identified using the Clinical Queries feature of PubMed, "hand" searching *JAMA*, *JAMA Pediatrics*, *Pediatrics*, *The Journal of Pediatrics*, and *The New England Journal of Medicine*, and from customized EvidenceUpdates alerts.

EBM PEARL: PATH ANALYSIS: Path analysis is an approach to estimating the magnitude and significance of possible causal relationships among variables. Path analysis is typically represented by a path diagram (Figure) that maps out the presumed causal relationships. The researcher constructs the path diagram based on the presumption of causal relationships among the variables. Statistical analysis is applied to the variables to assign weights to each relationship. For example, the **Figure** details possible causal relationships among training, dexterity, experience, a positive attitude (all these are independent variables), and successfully climbing to the top of a mountain peak (dependent variable). Each variable may have one or more possible causative relationships to the other variables and/or to the dependent variable. Arrows represent these relationships, one variable to another. Statistical analysis assigns a weight to each relationship: the higher the weight, the stronger the association. One can determine, based on the weights, whether a direct or indirect relationship with the dependent variable is more plausible. Finally, path analysis can only demonstrate association; causation can be suspected but cannot be determined in path analysis. The article by Temple et al[1] employed path analysis to assess the strength of the association of corporal punishment with dating violence.

Critical Statistical Distinction Pearl: Absolute Risk Reduction (ARR), Relative Risk Reduction (RRR), Relative Risk (RR): This Pearl is the first of a series attempting to clarify distinctions among common EBM-employed statistical concepts. ARR, RRR, and RR are related. All employ the concepts of the control event rate (CER = risk or probability of an adverse event in the control group) and the experimental/exposure event rate (EER, risk or probability of an adverse event in the experimental/exposure group). The ARR = CER-EER and is the absolute benefit (risk reduction rate) of a new drug or other therapeutic product. The RRR is the relative benefit, that is, the risk reduction rate relative to the risk rate in the control group. It is mathematically depicted as (CER-EER)/CER = ARR/CER. The RR is a ratio of the risks, EER/CER. The ARR and RRR statistics are used in therapeutic trials. The RR may be used in therapy studies, but is typically employed in harm/etiology studies, where the "event" is an adverse exposure (eg, cigarette smoke).

Reference

1. Temple JR, Choi HJ, Reuter T, Wolfe D, Taylor CA, Madigan S, et al. Childhood corporal punishment and future perpetration of physical dating violence. J Pediatr 2018;194:233-7.

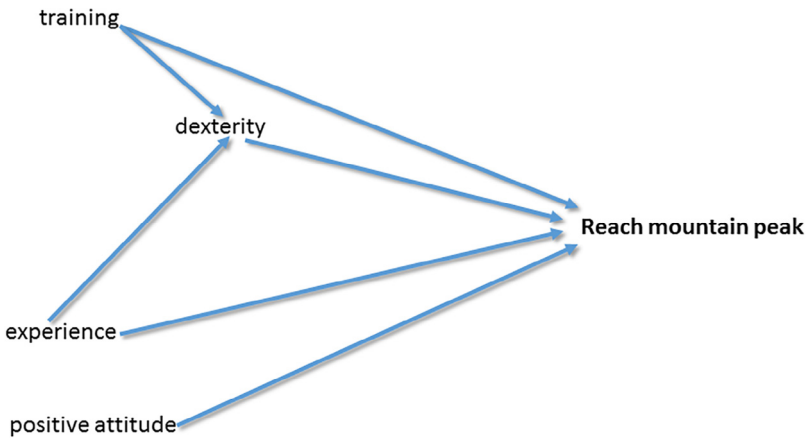

Figure. Example of a path diagram: possible causal factors in climbing to reach a mountain peak.

Corporal punishment associated with dating violence

Temple JR, Choi HJ, Reuter T, Wolfe D, Taylor CA, Madigan S, et al. Childhood Corporal Punishment and Future Perpetration of Physical Dating Violence. *J Pediatr* 2018;194: 233-7.

Question What is the association of corporal punishment with physical dating violence?

Design Cohort study.

Setting Cohort originally from a Texas high school.

Participants Young adults originally recruited as high school students.

Intervention Corporal punishment as a child.

Outcomes Perpetrating physical dating violence.

Main Results Corporal punishment was associated with perpetrating physical dating violence, adjusted OR 1.29, (95% CI 1.02-1.62).

Conclusions Corporal punishment is associated with dating violence.

Commentary Physical punishment of children remains a common disciplinary practice despite the mounting body of evidence that it increases the risk that children will engage in aggressive behavior and experience other deleterious outcomes.[1] Temple et al add to this literature by demonstrating that children who were physically punished as children have a 29% greater risk of a specific form of aggression as young adults, namely dating violence, than do children who were not physically punished. In comparison, a history of physical abuse increased the odds that an individual perpetrates dating violence by only 12%; in other words, less than one-half the risk conveyed by a history of physical punishment during childhood. These results support the notion that physical punishment teaches children that violence is acceptable in close relationships and supports the conclusion that physical punishment alone, over and above any experiences of physical abuse, is linked with higher levels of aggression in young adulthood. The strengths of the study, namely its relatively large and racially and ethnically diverse sample and its strong statistical methods, are tempered by the cross-sectional study design. Future research is needed to confirm these findings with a longitudinal design paired with causal effects modeling.

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Reference

1. Gershoff ET, Grogan-Kaylor A. Spanking and child outcomes: new meta-analyses and old controversies. J Fam Psychol 2016;30:453-69.

Subthreshold phototherapy during birth hospitalization may prevent readmission for phototherapy

Wickremasinghe AC, Kuzniewicz MW, McCulloch CE, Newman TB. Efficacy of Subthreshold Newborn Phototherapy During the Birth Hospitalization in Preventing Readmission for Phototherapy. *JAMA Pediatr* 2018;172:378-85.

Question Among neonates, what is the benefit of subthreshold phototherapy (STPh) during birth hospitalization, compared with no STPh, in preventing readmission for phototherapy?

Design Retrospective cohort study.

Setting Sixteen Kaiser Permanente Northern California hospitals.

Participants Newborns ≥35 weeks gestation.

Intervention STPh (started at 0.1 to 3.0 mg/dL below recommended AAP level) during birth hospitalization versus none.

Outcomes Readmission for phototherapy.

Main Results Adjusted OR, 0.28 (95% CI, 0.19-0.40), favoring STPh. 6.3 and 61 patients would require STPh to prevent one readmission for the highest and lowest risk quintiles, respectively. STPh required about one additional day in the hospital.

Conclusions STPh in this cohort study prevented readmission for phototherapy but added to the post-birth hospital stay and unnecessary phototherapy in 83%-94% of newborns with a bilirubin 0.1 to 3.0 mg/dL below the recommended AAP level.

Commentary The observational study of Wickremasinghe et al of newborns 35 or more weeks' gestation demonstrates that the common practice of STPh reduces readmission rates for phototherapy but at a cost of an additional day in the hospital. The observed number needed to treat was quite variable but lower when associated with hyperbilirubinemia risk factors,[1] most notably lower gestational age and being exclusively breastfed. Although these data add to a growing chorus that phototherapy is overused, the current findings suggest a legitimate role for STPh, perhaps a more nuanced one, but one that actively engages parents in discharge planning and decision making, balancing their goals, including feeding preferences, with an array of other relevant care considerations including neonatal maturity, access to follow-up services and the discharge day of the week among others.[2]

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References

1. Maisels MJ, Bhutani VK, Bogen D, Newman TR, Stark AR, Watchko JF. Hyperbilirubinemia in the newborn infant ≥35 weeks' gestation: an update with clarifications. Pediatrics 2009;124:1193-8.
2. Taylor JA, Chang PW. Initiating phototherapy at subthreshold levels. The slippery slope. JAMA Pediatr 2018;172:322-4. In press.