On Komlós-Révész estimation problem for random variables without variances

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Let $\{X_n\} \subset L_p(\mathbf{P})$, $1 < p \le 2$, $q = p/(p-1)$, be a sequence of martingale differences. We prove that the Komlós-Révész type weighted averages $\frac{\sum_{k=1}^n X_n/\|X_n\|_p^q}{\sum_{k=1}^n 1/\|X_n\|_p^q}$ converge a.s. and in the L_p-norm, and the limit is 0 if and only if $\sum_{n=1}^\infty 1/\|X_n\|_p^q = \infty$. We show also that convergence need not hold when we deal with a centered uncorrelated sequence (whether the series $\sum_{n=1}^\infty 1/\|X_n\|_2^2$ convergence or not). Furthermore, for $1 < p < 2$ all the results of Komlós-Révész are extended to symmetric independent p-stable random variables.