

Clustering Analysis of Oligohydramnios Risk Factor Clustering in Pregnant Women Using the Fuzzy C-Means (FCM) Method at Srikandi IBI General Hospital Jember

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ABSTRACT

Oligohydramnios is a pregnancy condition characterized by decreased amniotic fluid volume, which may cause complications for both mother and fetus. Based on medical records from Srikandi IBI Jember Hospital, oligohydramnios cases have increased and are among the top ten inpatient conditions. This study aimed to cluster risk factors for oligohydramnios in pregnant women using Fuzzy C-Means (FCM). This quantitative study used a data mining approach on medical records of oligohydramnios patients from 2024–2025. Of 255 records, 253 were analyzed. Variables included maternal age, gestational age, gravida, blood pressure, fetal heart rate (FHR), Amniotic Fluid Index (AFI), and premature rupture of membranes (PROM). The stages included data preprocessing, Min-Max Normalization, determining the number of clusters using the Elbow method, FCM clustering, and evaluation using the Partition Coefficient (PC). Results showed that four clusters were optimal, with a PC value of 0.674, and clustering converged at the 18th iteration. C1 represented primigravida women without PROM, characterized by reproductive age, term pregnancy, normal blood pressure and FHR, and AFI 2.1–4 cm. C2 represented a group of multigravida women without PROM, characterized by reproductive age, term pregnancy, normal blood pressure and FHR, and an AFI of 2.1–4 cm. C3 represented multigravida women with PROM, characterized by reproductive age, term pregnancy, normal blood pressure and FHR, and AFI 1.1–2 cm and 3.1–4 cm. C4 represented primigravida women with PROM, characterized by reproductive age, term pregnancy, higher blood pressure than other clusters, normal FHR, and AFI 2.1–3 cm.

Key words : *clustering, data mining, fuzzy c-means, oligohydramnion*