

## RINGKASAN

**“Pengembangan Protap Pengelolaan Limbah Cair Rumah Sakit Guna Meningkatkan Kualitas Limbah Cair Rumah Sakit (Studi Kasus Pengelolaan Limbah Cair Di Badan Pelayanan RSUD Wangaya Kota Denpasar Tahun 2005)”,**

Tri Habsari Merdekawati

Rumah sakit merupakan organisasi yang padat modal, padat tenaga dan padat teknologi. Oleh karena itu dalam mengelola rumah sakit perlu menerapkan prinsip-prinsip manajemen rumah sakit, sehingga dapat tercapai *efisiensi*, *equity* dan *quality*. Semakin besar rumah sakit maka kegiatanpun semakin banyak sehingga perlu disusun berbagai program. Rumah sakit sebagai institusi yang mempunyai fungsi dan tugas memberikan pelayanan kesehatan kepada masyarakat secara paripurna, kegiatannya tidak saja memberikan dampak positif bagi masyarakat sekitarnya tetapi juga kemungkinan dampak negatif berupa cemaran akibat proses kegiatan maupun limbah yang dibuang tanpa pengelolaan yang benar dan sesuai dengan prinsip-prinsip pengelolaan lingkungan secara menyeluruh. Limbah cair RS merupakan hasil dari proses kegiatan operasional RS baik medis maupun non medis, yang kemudian diolah didalam instalasi pengolahan air limbah RS, pengelolaan limbah cair RS dimulai dari unit-unit penghasil limbah cair sampai dengan IPAL RS.

RS Wangaya Denpasar merupakan RS dengan tipe B Non pendidikan telah melakukan pengelolaan limbah cair dengan menggunakan 1 unit Instalasi Pengolah Air Limbah (IPAL) dengan sistem aerasi dengan kapasitas total 160 m<sup>3</sup>/hari, yang telah dibangun sejak Tahun 1995. Permasalahan dalam penelitian ini Prosedur Tetap/Protap pelaksanaan pengelolaan limbah cair RS yang masih terdapat kesenjangan dalam pelaksanaan sehingga mengakibatkan kualitas limbah cair RS masih diatas bakumutu dari standar yang ditetapkan oleh Menteri Negara Lingkungan Hidup dan SK Gubernur Bali. Kualitas limbah cair RS dipengaruhi oleh faktor SDM (pendidikan, pengetahuan, ketrampilan dan motivasi), dana, peraturan, metode (protap), peralatan dan material limbah cair RS. Dari data awal didapat protap pengelolaan limbah cair yang relatif sederhana dibandingkan dengan kondisi RS dan parameter kualitas limbah cair yang melebihi bakumutu adalah COD, NH<sub>3</sub>, dan Bakteri Coliform. Maka diadakan penelitian pengembangan protap untuk meningkatkan kualitas limbah cair RS.

Tujuan dari penelitian ini adalah mengembangkan Protap untuk meningkatkan kualitas akhir Limbah Cair RS berdasarkan hasil analisis pengelolaan limbah cair RS. Berdasarkan analisis yang meliputi input yang didalamnya mencakup Sumber Daya Manusia (man), anggaran (money), limbah cair yang dihasilkan (material), peralatan (perpipaan dan mesin), protap (methods); proses pengolahan limbah cair, dan kualitas akhir limbah cair, hasilnya menunjukkan bahwa keberhasilan pelaksanaan suatu kegiatan sekaligus kendala yang dapat ditemukan didalam proses tersebut. Kualitas akhir limbah cair yang tidak membahayakan manusia dan lingkungan adalah output yang diharapkan dari seluruh rangkaian proses pengelolaan limbah cair RS. Dari analisis input, proses dan output pengelolaan limbah cair RS kemudian ditelaah dan didiskusikan secara mendalam dengan pihak manajemen RS, maka diputuskan pengembangan protap pengelolaan limbah cair RS dengan beberapa kegiatan yang mendukung pelaksanaan protap yang telah dikembangkan tersebut.

Kegiatan yang dilaksanakan dalam protap yang baru dikembangkan tersebut antara lain sosialisasi protap RS dan penyegaran pengetahuan limbah cair RS, pengurusan bak IPAL RS, pemantauan dan pengawasan pengolahan limbah cair, penyusunan jadwal kegiatan dan rencana program pengelolaan limbah cair serta pengambilan sampel limbah cair sebagai evaluasi dari uji coba protap.

Berdasarkan hasil analisis uji t berpasangan terhadap parameter kualitas limbah cair setelah pelaksanaan protap baru IPAL tersebut menunjukkan perbedaan yang bermakna untuk variabel pH, BOD, COD, TSS, NH<sub>3</sub>, PO<sub>4</sub>, dan bakteri coliform, dan tidak ada perbedaan untuk variabel suhu. Khusus untuk variabel bakteri coliform meskipun menunjukkan perbedaan yang bermakna tetapi nilainya masih menunjukkan di atas baku mutu standar yang telah ditetapkan hal ini disebabkan karena kerusakan mesin pompa chlorinasi .

Disarankan adanya bentuk pelatihan atau penyegaran pengetahuan limbah RS secara berkala untuk meningkatkan pengetahuan dan motivasi petugas di tingkat pelaksana, diadakan pemantauan dan pengawasan secara berkala pelaksanaan tugas dilapangan , evaluasi dan perbaikan protap RS yang disesuaikan dengan kondisi RS dan pelaksanaan tugas dilapangan, penusunan progam kegiatan sesuai dengan pedoman yang ada dan peningkatan anggaran pengelolaan limbah RS khususnya limbah cair RS, sehingga kualitas limbah RS tidak akan membahayakan lingkungan RS dan masyarakat.



**SUMMARY**

**The Development of Hospital Liquid Waste Processing Procedure to  
Improve the Quality of Hospital Liquid Waste  
(A Case Study of Liquid Waste Processing Management at  
Wangaya Hospital, Denpasar, 2005)**

**Tri Habsari Merdekawati**

Hospital is organization that compact capital, compact power and compact technology. So that in managing hospital need to be practicing hospital management principal, so that can be reached efficiency, equity and quality. More big a hospital is so programmers more bigger then need to be arranged many programme. Hospital as institution that have function and job giving health service to public totally, its programme not just giving positive effect as pollution as effect programme also waste water treatment that is trashed without right processing and match with environment management principal as whole way hospital liquid rubbish heap is result from operational process at hospital medicly also nom medicly, and then processed inside hospitals liquid waste water processing installation, hospital's liquid waste water treatment processing started from unit-unit produce liquid waste water until hospital's IPAL.

Wangaya hospital Denpasar is hospital with B type non education have done liquid waste water treatment processing by using 1 unit water waste water treatment installation processor (IPAL) with aeration system with total capacity 160 m<sup>3</sup>/day, that have built since 1995. Problem in this research is fixed procedure hospital's liquid waste water treatment processing that still found gap in a practicing so that consequence hospital's liquid waste water quality still over standard quality from standard that is fixed by life environment state minister and Bali Governor SK. Hospital's liquid waste water quality influenced by SDM factor (education, knowledge, skill and motivation), fund, rules, method (fixed procedure), equipment and hospital's liquid rubbish heap material. From early data taked fixed procedure of liquid waste water treatment processing which relative simple compared with hospital condition and parameter waste water quality that over quality standard is COD, NH<sub>3</sub>, coliform bacteri. So held fixed procedure development to increase hospital's liquid waste water.

Purpose from this research is developing fixed procedure to increasing hospital's liquid waste water final quality according analyse result hospital's liquid

waste water treatment processing. According analyse that include input inside inclusive human resources (man), budget (money), waste water that is produced (material), equipment (pipe and machine), fixed procedure (methods); liquid rubbish heap manage process, and waste water final quality, its result show that succesfull of a programme and also risk that can be found in that process. Liquid waste water final quality which not endangered human and environment is output that is hoped from all hospital's liquid waste water treatment processing. From input analyse, process and output hospital's liquid waste water treatment processing than learned and discussed with hospital's management so decided development fixed procedure hospital's liquid waste water treatment processing with some programme that supporting fixed procedure practice that have developed.

Programme that have held in new fixed procedure that have just developed such as sosialisation of hospital's fixed procedure and hospital's liquid waste water treatment knowledge refreshing, hospital's IPAL copper cleansing, checking and controlling of liquid waste water treatment processing, schedule arranging and programme plan liquid waste water treatment processing also liquid waste water sample taking.

According analyse result T, test towards parameter liquid waste water quality after held programme IPAL copper cleansing showing means difference for parameter pH, BOD, COD, TSS, PO4 and coliform bakteri, and not means for parameter temperature. Especially for parameter coliform bakteri although showing means difference but that number still showing upper standard quality which have fixed this thing is caused because chlorination pump machine destroy.

Suggested help training or hospital's liquid waste water treatment knowledge refreshing continuely to increasing knowledge and motivation officer at executor grade, held checking and control continuely job in a practice, evaluation and servicing fixed procedure hospital that flexibled with hospital condition and job held at practice programme scheduling arranging flexible with guidance and budget increasing of hospital's liquid waste water treatment processing especially hospital's liquid rubbish heap, than hospital's liquid waste water will not endangered hospital environment and public.



**ABSTRACT**

**The Development of Hospital Liquid Waste Processing Procedure to  
Improve the Quality of Hospital Liquid Waste  
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Denpasar Wangaya Hospital is a B type, non-training hospital. It possesses a liquid waste processing system by owning one Water Waste Disposal Unit (WWDU) using an aeration system with a total capacity of 160 m<sup>3</sup>/day, established in 1995. The problem faced by Denpasar Wangaya Hospital (DWH) is a discrepancy between DWH liquid waste processing fixed-procedure and the real execution, resulting in low quality hospital liquid waste, below the quality standard of the Minister of Environment and Bali's Governor decree. The quality of hospital liquid waste is influenced by human resource factors (education, knowledge, skill, and motivation); fund; regulation; method (fixed-procedure), tools and material. From the preliminary data -a much simpler liquid waste processing procedure compared to hospital condition was implemented- it produced low liquid waste quality in pertaining to the content of COD, NH<sub>3</sub> and coliform bacteria. These three substances had passed above the allowed liquid waste parameter. Therefore, this research was conducted to improve DWH liquid waste quality by developing a fixed-procedure.

This was an action research carried out from May until July 2005. Grounded on the analysis covering inputs of human resource (man), budget (money), produced liquid waste (material), tools (machineries and pipes), fixed procedure (method), process and quality of liquid waste, revealed that inside a success of an activity implementation, implicitly existed all inhibitions of a process. A quality of liquid waste which is not harmful to human and its environment was the real expected outcome of hospital liquid waste processing series. After a serious discussion with DWH management taken from input, proses, and output analysis; the hospital management had resolved a fixed- procedure development for improving DWH liquid waste. Those were manifested in several activities, i.e. socializing DWH fixed-procedure, refreshing DWH liquid waste knowledge, draining WWDU tanks, monitoring and supervising liquid waste processing, formulating schedule of activities, planning liquid waste processing program, and sampling the liquid waste.

Based on t-test analysis of quality parameter after draining WWDU tanks, it showed a significant difference of pH, BOD, COD, TSS, NH<sub>3</sub>, PO<sub>4</sub> and coliform bacteria and no significant difference of temperature. Specifically for coliform bacteria parameter, although it did show a significant difference, yet the value was above the agreed standard due to the damaged chlorination pump.

It was suggested to provide trainings/workshops or a refreshing course, periodical monitoring, field work supervision and evaluation, to draft activity programs in-line with the manual and to increase the hospital liquid waste budget.

**Key words:** hospital liquid waste, development, fixed-procedure